



**SUPPLEMENTAL FILING**

**on**

**Need For and Alternatives to the Wuskwatim  
Project  
(NFAAT)**

**August 8, 2003**

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2003 08 08

Mr. Trent Hreno  
Chair, Technical Advisory Committee  
Manitoba Conservation  
169 - 123 Main Street  
Winnipeg, MB R3C 1A5

Dear Mr. Hreno:

**FILING OF SUPPLEMENTARY FILING ON NEED FOR AND ALTERNATIVES TO (NFAAT) THE WUSKWATIM PROJECT**

We are pleased to submit for your consideration the *Supplementary Filing On Need For and Alternatives To the Wuskwatim Project*, August 2003. Forty two print copies of this filing are enclosed as advised by Mr. L. Strachan. We understand you will distribute these, as required, to Technical Advisory Committee (TAC) members and the Public Registries.

Under separate letter, Manitoba Hydro and Nisichawayasihk Cree Nation are submitting the Supplementary filings for the:

- *Environmental Impact Statement for the Wuskwatim Transmission Project, and the Environmental Impact Statement for the Wuskwatim Generation Project, April 2003.*

This NFAAT supplemental filing is provided in response to the adequacy comments received on July 10, 2003. It also includes supplemental information in response to comments and questions arising at the June TAC Technical Workshop, the July Participant technical workshops and subsequent informal discussions.

An electronic copy of the NFAAT supplemental filing will be provided in conjunction with the supplemental filing for the two EIS's.

Copies are being provided directly to the contact lists for the Wuskwatim Clean Environment Commission review to assist in the CEC pre-hearing process.



Mr. Trent Hreno  
2003 08 08  
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The information in this filing is presented according to content in the original NFAAT submission on a chapter by chapter basis. There is an index listing responses.

Manitoba Hydro acknowledges with appreciation, the thorough review of the NFAAT, as demonstrated by the extent and quality of the many questions raised for our consideration. These questions and our responses will assist in a rigorous, comprehensive review of our proposals.

We will be pleased to answer any other questions you may have on this filing.

Sincerely,

"Ed Wojczynski"

Ed Wojczynski  
Division Manager  
Power Planning and Development

EW/tb /2003 08 06.1

- C. Councillor W.E. Thomas, NCN Future Development  
Clean Environment Commission Contact Lists:
- Funded Participants
  - Non-Funded Participants
  - Others

Enclosures

**NFAAT Supplemental Filing- August 8, 2003**

| Supplemental Response | Associated Attachment(s) | Main Submission Chapter Reference | Subject                                                                                                                                                     | Origination*                          |
|-----------------------|--------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| CAC/MSOS/NFAAT/S/1    | CAC/MSOS/NFAAT/S/1a      | 4                                 | Detailed levelized cost calculations for the main resource alternatives                                                                                     | CAC/MSOS item 5 & 6                   |
| CAC/MSOS/NFAAT/S/2    |                          | 4                                 | Appropriateness of using 2001 PowerSmart Plan under current export prices and market opportunities                                                          | CAC/MSOS item 4                       |
| CCC/NFAAT/S/1         |                          | 5                                 | Potential impact of standard market design (SMD) on electricity markets and on Manitoba Hydro's export market                                               | CCC Page 4 comments                   |
| CAC/MSOS/NFAAT/S/3    |                          | 5                                 | Further information on High and Low export price forecasts and historic average prices                                                                      | CAC/MSOS item 1                       |
| CAC/MSOS/NFAAT/S/4    | CAC/MSOS/NFAAT/S/4a      | 5                                 | Recent load growth projections in MAPPS-US and supply forecasts                                                                                             | CAC/MSOS item 1                       |
| CCC/NFAAT/S/2         | CCC/NFAAT/S/2a           | 6                                 | Summary of new information from the 2003 Power Resource Plan and sensitivity analysis regarding its implications on Wuskwatim evaluations                   | CCC Page 2 Comments                   |
| CCC/NFAAT/S/3         |                          | 6                                 | Assessment of the decrease to Low Export Prices that would be needed to have the project breakeven with WACC (6.08%) and Cost of Debt (5.34%)               | CCC page 3 comments                   |
| CCC/NFAAT/S/4         |                          | 6                                 | IRR Sensitivity on the impact of a drought of record occurring coincident with the advanced in-service date of the project                                  | CCC page 3 comments & CAC/MSOS item 2 |
| MH/NCN/NFAAT/S/1      | MH/NCN/NFAAT/S/1a        | 6                                 | Social Benefit Cost Analysis- Low & High export prices                                                                                                      | MH initiated                          |
| CAC/MSOS/NFAAT/S/6    |                          | 6                                 | Sensitivity on Wuskwatim Project economics to development of twice the current forecast of DSM, 250 MW of wind and a combination of these two sensitivities | CAC/MSOS item 4                       |
| MH/NCN/NFAAT/S/2      | MH/NCN/NFAAT/S/2a        | 6                                 | Summary of Economic Evaluations and Sensitivities                                                                                                           | MH initiated                          |
| CCC/NFAAT/S/5         |                          | 7                                 | Financial Sensitivity - 5 year low water flow conditions coinciding with advanced in-service                                                                | CCC Page 3 comments & CAC/MSOS item 2 |
| CAC/MSOS/NFAAT/S/7    |                          | 7                                 | Financial Stability                                                                                                                                         | CCC page 3 comments                   |
| CCC/NFAAT/S/6         |                          | 7                                 | Projected balance sheets and financing requirements statements                                                                                              | CCC page 3 comments                   |
| CCC/NFAAT/S/7         | CCC/NFAAT/S/7a           | 7                                 | Consolidation Accounting                                                                                                                                    | CCC page 3 comments                   |
| CCC/NFAAT/S/8         |                          | 7                                 | Financial Sensitivity - 15% capital increase/decrease in base capital costs                                                                                 | CCC page 3 comments                   |
| CAC/MSOS/NFAAT/S/9    |                          | 7                                 | Financial impact of 2003 Power Resource Plan Update                                                                                                         | CCC Page 2 Comments                   |
| CCC/NFAAT/S/10        |                          | 7                                 | Impact of Partnership Dividend Policy on Manitoba Hydro                                                                                                     | CAC/MSOS Informal Meeting             |
| CAC/MSOS/NFAAT/S/11   | CAC/MSOS/NFAAT/S/11a     | 7                                 | Summarized Partnership Projected Income Statements                                                                                                          | CAC/MSOS Informal Meeting             |
| CCC/NFAAT/S/11        |                          | Appendices                        | Document Updates & Summary of changes                                                                                                                       | CCC page 1 comments                   |
| CCC/NFAAT/S/12        |                          | Appendix 2                        | CSP                                                                                                                                                         | CCC page 1 comments                   |
| CCC/NFAAT/S/13        |                          | Appendix 4                        | Newsletter #4                                                                                                                                               | CCC page 1 comments                   |
| CCC/NFAAT/S/14        |                          | Appendix 7                        | Economic Outlook                                                                                                                                            | CCC page 1 comments                   |
| CCC/NFAAT/S/15        |                          | Appendix 8                        | Load Forecast Report 2003                                                                                                                                   | CCC page 1 comments                   |

\*Origination refers to comments provided by

CAC/MSOS in their letter to Manitoba Conservation of June 30, 2003;  
Crown Corporations Council in their letter to Manitoba Conservation of June 27, 2003, and  
informal discussions during and after the July 9, 2003 workshop.

**CAC/MSOS/NFAAT/S/1**

**Request:** CAC/MSOS requested detailed levelized cost calculations for the main resource alternatives

**Response:** Attached are detailed levelized cost calculations for the main competing resource alternatives of interest to Manitoba Hydro. The levelized costs provided are for upper and lower bounds of the ranges of costs indicated in Figure 4.5 in the "Need For and Alternatives to the Wuskwatim Project".

Detailed levelized costs included here are for:

- Wuskwatim
- Conawapa
- Gull
- Wind
- SCCT
- CCCT
- Coal
- DSM

See attached (CAC/MSOS/NFAAT/S/1a)

For more information on economic levelized costs, refer to Section 4.2.4 "Need For and Alternatives to the Wuskwatim Project".

Levelized Costs of : **Wuskwatim-09**

**66.1 \$/MW h**

- Referenced to Southern Bus  
Includes Capital Tax & Development Fund

In-Service Date = **2009**

**RATES**

Discount Rate 10.00%  
Water Rental = 3.341

2002 \$ / MW h

Capacity (MW)  
Summer = 200  
Average = 200  
Winter = 200

Energy (GW h)  
Dependable = 1250  
Average = 1520  
High = 1700

| Fiscal Year<br>Beg April | Capacity<br>(MW) | Ave GW h<br>@ gen | Generation Costs (millions of 2002 base dollars) |                 |                            |                                    |                             | Transmission Costs (millions of 2002 base dollars) |                            |                       |                               |                              |                               |
|--------------------------|------------------|-------------------|--------------------------------------------------|-----------------|----------------------------|------------------------------------|-----------------------------|----------------------------------------------------|----------------------------|-----------------------|-------------------------------|------------------------------|-------------------------------|
|                          |                  |                   | Generating<br>Station<br>@ 67                    | Water<br>Rental | Generation<br>O&M<br>Costs | Generation<br>Capital Tax<br>@ 50% | Generation<br>TOTAL<br>COST | TL<br>Capital Cost<br>@ 50                         | TS<br>Capital Cost<br>@ 35 | Trans<br>O&M<br>Costs | Trans<br>Capital Tax<br>@ 50% | Trans<br>Development<br>Fund | Transmission<br>TOTAL<br>COST |
| 2002                     | 0                | 0                 | 0.00                                             | 0.00            | 0.00                       | 0.08                               | 0.08                        | 0.00                                               | 0.00                       | 0.00                  | 0.01                          | 0.00                         | 0.01                          |
| 2003                     | 0                | 0                 | 16.55                                            | 0.00            | 0.00                       | 0.08                               | 16.64                       | 0.46                                               | 0.84                       | 0.00                  | 0.01                          | 0.00                         | 1.31                          |
| 2004                     | 0                | 0                 | 69.36                                            | 0.00            | 0.00                       | 0.43                               | 69.79                       | 5.32                                               | 2.57                       | 0.00                  | 0.05                          | 0.00                         | 7.94                          |
| 2005                     | 0                | 0                 | 110.53                                           | 0.00            | 0.00                       | 0.98                               | 111.51                      | 5.15                                               | 6.88                       | 0.00                  | 0.11                          | 0.00                         | 12.15                         |
| 2006                     | 0                | 0                 | 108.62                                           | 0.00            | 0.00                       | 1.53                               | 110.14                      | 25.44                                              | 11.03                      | 0.00                  | 0.29                          | 0.00                         | 36.76                         |
| 2007                     | 0                | 0                 | 115.41                                           | 0.00            | 0.00                       | 2.10                               | 117.51                      | 23.60                                              | 15.64                      | 0.00                  | 0.48                          | 0.00                         | 39.73                         |
| 2008                     | 0                | 0                 | 77.70                                            | 0.00            | 0.00                       | 2.49                               | 80.19                       | 15.50                                              | 16.16                      | 0.00                  | 0.64                          | 0.00                         | 32.30                         |
| 2009                     | 150              | 1015              | 21.86                                            | 3.32            | 1.64                       | 2.60                               | 29.42                       | 9.00                                               | 0.60                       | 0.50                  | 0.50                          | 5.58                         | 1.62                          |
| 2010                     | 200              | 1520              | 0.00                                             | 5.08            | 1.64                       | 2.60                               | 9.32                        | -9.48                                              | -1.79                      | 0.60                  | 0.54                          |                              | -10.11                        |
| 2011                     | 200              | 1520              | 0.00                                             | 5.08            | 1.64                       | 2.60                               | 9.32                        | -0.17                                              | -0.23                      | 0.60                  | 0.54                          |                              | 0.74                          |
| 2012                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2013                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2014                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2015                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2016                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2017                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2018                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2019                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2020                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2021                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2022                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2023                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2024                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2025                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2026                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2027                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2028                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2029                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2030                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2031                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2032                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2033                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2034                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2035                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2036                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2037                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2038                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.84                       | 0.60                  | 0.54                          |                              | 1.99                          |
| 2039                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 2.57                       | 0.60                  | 0.54                          |                              | 3.72                          |
| 2040                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 6.88                       | 0.60                  | 0.54                          |                              | 8.03                          |
| 2041                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 11.03                      | 0.60                  | 0.54                          |                              | 12.17                         |
| 2042                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 15.64                      | 0.60                  | 0.54                          |                              | 16.78                         |
| 2043                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 16.16                      | 0.60                  | 0.54                          |                              | 17.31                         |
| 2044                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.60                       | 0.60                  | 0.54                          |                              | 1.74                          |
| 2045                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | -1.79                      | 0.60                  | 0.54                          |                              | -0.65                         |
| 2046                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | -0.23                      | 0.60                  | 0.54                          |                              | 0.91                          |
| 2047                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2048                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2049                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2050                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2051                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2052                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2053                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2054                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2055                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2056                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2057                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2058                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2059                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2060                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2061                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2062                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2063                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2064                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2065                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2066                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2067                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2068                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2069                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2070                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2071                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2072                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2073                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2074                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2075                     | 200              | 1520              | 0.00                                             | 5.08            | 1.73                       | 2.60                               | 9.41                        | 0.00                                               | 0.00                       | 0.60                  | 0.54                          |                              | 1.14                          |
| 2076                     | 50               | 506               | 0.00                                             | 1.69            | 0.09                       | 2.60                               | 4.38                        | 0.00                                               | 0.00                       | 0.00                  | 0.00                          |                              | 0.54                          |
| 2077                     | 0                | 0                 | 0.00                                             | 0.00            | 0.00                       | 0.00                               | 0.00                        | 0.00                                               | 0.00                       | 0.00                  | 0.00                          |                              | 0.00                          |

Total 2002 Base 13.400 101.840 520.02 340.25 116.02 184.50 1,160.79 56.85 103.42 40.20 38.55 5.58 244.59  
Total 2002 P.V. 1,101 8,307 356.33 27.75 9.64 19.66 413.39 40.36 35.01 3.38 4.08 2.86 65.70

Adjusted for Losses @ 10%

| Levelized Energy Cost (2002 \$/MW h) @ SOUTH |      |
|----------------------------------------------|------|
| Generation (capital, O&M, water rentals)     | 54.7 |
| Transmission (capital, O&M)                  | 11.3 |
| (Cost NPV / Energy NPV) Total                | 66.1 |

| Levelized Energy Cost (2002 \$/MW h) @ SOUTH |      |
|----------------------------------------------|------|
| Generation (capital only)                    | 47.2 |
| Transmission Line (capital only)             | 5.3  |
| Transmission Station (capital only)          | 4.6  |
| Total Capital                                | 57.2 |
| O&M                                          | 1.7  |
| Water Rental                                 | 3.7  |
| Capital Tax                                  | 3.1  |
| Development Fund                             | 0.4  |
| (Cost NPV / Energy NPV) Total                | 66.1 |

Adjusted for North - South Losses 10.000%  
Discount Rate 10.000%

Levelized Costs July 24 2003.xls  
7/24/03 4:02 PM

# Levelized Costs of : Gull-12

75.7 \$/MWh

- Referenced to Southern Bus

In-Service-Date = 2012

Includes Capital Tax & Development Fund. Full Converters Costs less 500 KV HVDC line

## RATES

Discount Rate  
Water Rental =

10.00%  
3.341

2002 \$ / MWh

Capacity (MW)

Summer = 630

Average = 623

Winter = 615

Energy (GWh)

Dependable = 2900

Average = 4430

High = 5320

| Fiscal<br>Year<br>Beg. April | Capacity<br>(MW) | Ave GWh<br>@ per | Generation Costs (millions of 2002 base dollars) |                 |                            |                                    |                             | Transmission Costs (millions of 2002 base dollars) |                          |                             |                               |                              | Trans<br>Development<br>Fund | Trans<br>TOTAL<br>COST |
|------------------------------|------------------|------------------|--------------------------------------------------|-----------------|----------------------------|------------------------------------|-----------------------------|----------------------------------------------------|--------------------------|-----------------------------|-------------------------------|------------------------------|------------------------------|------------------------|
|                              |                  |                  | Generating<br>Station<br>67                      | Water<br>Rental | Generation<br>O&M<br>Costs | Generation<br>Capital Tax<br>@ 50% | Generation<br>TOTAL<br>COST | TL<br>Capital Cost<br>50                           | YS<br>Capital Cost<br>36 | Trans<br>Capital Cost<br>50 | Trans<br>Capital Tax<br>@ 50% | Trans<br>Development<br>Fund |                              |                        |
| 2002                         | 0                | 0                | 0.00                                             | 0.00            | 0.00                       | 0.00                               | 0.00                        | 0.00                                               | 0.00                     | 0.00                        | 0.00                          | 0.00                         | 0.00                         | 0.00                   |
| 2003                         | 0                | 0                | 17.10                                            | 0.00            | 0.00                       | 0.09                               | 17.18                       | 0.00                                               | 0.00                     | 0.00                        | 0.00                          | 0.00                         | 0.00                         | 0.00                   |
| 2004                         | 0                | 0                | 28.77                                            | 0.00            | 0.00                       | 0.23                               | 29.00                       | 0.00                                               | 0.00                     | 0.00                        | 0.00                          | 0.00                         | 0.00                         | 0.00                   |
| 2005                         | 0                | 0                | 25.97                                            | 0.00            | 0.00                       | 0.36                               | 26.33                       | 0.52                                               | 2.33                     | 0.00                        | 0.01                          | 0.00                         | 0.00                         | 2.87                   |
| 2006                         | 0                | 0                | 64.59                                            | 0.00            | 0.00                       | 0.63                               | 65.23                       | 1.04                                               | 3.50                     | 0.00                        | 0.04                          | 0.00                         | 0.00                         | 4.57                   |
| 2007                         | 0                | 0                | 112.19                                           | 0.00            | 0.00                       | 1.16                               | 113.38                      | 6.24                                               | 7.00                     | 0.00                        | 0.10                          | 0.00                         | 0.00                         | 13.33                  |
| 2008                         | 0                | 0                | 245.83                                           | 0.00            | 0.00                       | 2.42                               | 248.25                      | 6.24                                               | 11.66                    | 0.00                        | 0.19                          | 0.00                         | 0.00                         | 18.09                  |
| 2009                         | 0                | 0                | 282.73                                           | 0.00            | 0.00                       | 3.84                               | 286.57                      | 31.18                                              | 69.96                    | 0.00                        | 0.70                          | 0.00                         | 0.00                         | 101.84                 |
| 2010                         | 0                | 0                | 303.57                                           | 0.00            | 0.00                       | 5.35                               | 308.92                      | 29.10                                              | 95.62                    | 0.00                        | 1.32                          | 0.00                         | 0.00                         | 128.04                 |
| 2011                         | 0                | 0                | 241.29                                           | 0.00            | 0.00                       | 6.56                               | 247.85                      | 29.10                                              | 152.75                   | 0.00                        | 2.23                          | 0.00                         | 0.00                         | 184.08                 |
| 2012                         | 217              | 2277             | 209.69                                           | 4.58            | 1.84                       | 7.61                               | 223.72                      | 0.52                                               | 111.94                   | 1.96                        | 2.79                          | 16.11                        | 133.32                       |                        |
| 2013                         | 623              | 4430             | 27.05                                            | 14.80           | 1.84                       | 7.89                               | 50.54                       | 0.00                                               | 11.66                    | 1.96                        | 2.85                          |                              | 16.47                        |                        |
| 2014                         | 623              | 4430             | 0.00                                             | 14.80           | 1.84                       | 7.89                               | 24.53                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2015                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2016                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2017                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2018                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2019                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2020                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2021                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2022                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2023                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2024                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2025                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2026                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2027                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2028                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2029                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2030                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2031                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2032                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2033                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2034                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2035                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2036                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2037                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2038                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2039                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2040                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 2.33                     | 1.96                        | 2.85                          |                              | 7.14                         |                        |
| 2041                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 3.50                     | 1.96                        | 2.85                          |                              | 8.31                         |                        |
| 2042                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 7.00                     | 1.96                        | 2.85                          |                              | 11.81                        |                        |
| 2043                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 11.66                    | 1.96                        | 2.85                          |                              | 16.47                        |                        |
| 2044                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 69.96                    | 1.96                        | 2.85                          |                              | 74.77                        |                        |
| 2045                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 95.62                    | 1.96                        | 2.85                          |                              | 100.43                       |                        |
| 2046                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 152.75                   | 1.96                        | 2.85                          |                              | 157.56                       |                        |
| 2047                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 111.94                   | 1.96                        | 2.85                          |                              | 116.75                       |                        |
| 2048                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 11.66                    | 1.96                        | 2.85                          |                              | 16.47                        |                        |
| 2049                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2050                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2051                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2052                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2053                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2054                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2055                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2056                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2057                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2058                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2059                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2060                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2061                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2062                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2063                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2064                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2065                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2066                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2067                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2068                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2069                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2070                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2071                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2072                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2073                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2074                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2075                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2076                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2077                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2078                         | 623              | 4430             | 0.00                                             | 14.80           | 2.00                       | 7.89                               | 24.70                       | 0.00                                               | 0.00                     | 1.96                        | 2.85                          |                              | 4.81                         |                        |
| 2079                         | 406              | 3059             | 0.00                                             | 10.22           | 0.16                       | 7.89                               | 18.28                       | 0.00                                               | 0.00                     | 0.00                        | 2.85                          |                              | 2.85                         |                        |
| 2080                         | 52               | 475              | 0.00                                             | 1.59            | 0.16                       | 7.89                               | 9.64                        | 0.00                                               | 0.00                     | 0.00                        | 2.85                          |                              | 2.85                         |                        |
| 2081                         | 0                | 0                | 0.00                                             | 0.00            | 0.00                       | 0.00                               | 0.00                        | 0.00                                               | 0.00                     | 0.00                        | 2.85                          |                              | 2.85                         |                        |

|                 |        |         |          |        |        |        |          |        |        |        |        |       |          |
|-----------------|--------|---------|----------|--------|--------|--------|----------|--------|--------|--------|--------|-------|----------|
| Total 2002 Base | 41 708 | 296.810 | 1,578.82 | 991.64 | 134.07 | 565.06 | 3,269.62 | 103.92 | 932.84 | 131.33 | 204.16 | 16.11 | 1,388.37 |
| Total 2002 P.V. | 2.461  | 17.412  | 794.43   | 58.17  | 8.31   | 43.65  | 904.56   | 50.61  | 214.99 | 8.30   | 14.19  | 6.21  | 294.29   |

Adjusted for Losses @ 10%

|                                             |      |
|---------------------------------------------|------|
| Levelized Energy Cost (2002 \$/MWh) @ SOUTH |      |
| Generation (capital, O&M, water rentals)    | 57.1 |
| Transmission (capital, O&M)                 | 18.6 |
| (Cost NPV / Energy NPV) Total               | 75.7 |

67.4 \$/MW h

Levelized Costs of: **Conawapa - 2015, 10 unit scheme**

- Referenced to Southern Bus

In-Service-Date = **2015**

Includes Capital Tax &amp; Development Fund, Full Converters Costs less 500 kV HVDC line

## RATES

Discount Rate: 10.00%  
Water Rental = 3.341

2002 \$ / MW h

## Capacity (MW)

Summer = 1260

Average = 1260

Winter = 1230

## Energy (GW h)

Dependable = 4550

Average = 7000

High = 9000

|             |          |          | Generation Costs (millions of 2002 base dollars) |              |                      |                        |                  | Transmission Costs (millions of 2002 base dollars) |                 |                 |                   |                        |                    |
|-------------|----------|----------|--------------------------------------------------|--------------|----------------------|------------------------|------------------|----------------------------------------------------|-----------------|-----------------|-------------------|------------------------|--------------------|
| Fiscal Year | Capacity | Ave GW h | Generating Station                               | Water Rental | Generation O&M Costs | Generation Capital Tax | Generation TOTAL | TL Capital Cost                                    | TS Capital Cost | Trans O&M Costs | Trans Capital Tax | Trans Development Fund | Transmission TOTAL |
| Beg. April  | (MW)     | @ gen    | 67                                               |              | Costs                | 0.50%                  | COST             | 60                                                 | 35              | Costs           | 0.50%             | Fund                   | COST               |
| 2002        | 0        | 0        | 0.00                                             | 0.00         | 0.00                 | 0.00                   | 0.00             | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2003        | 0        | 0        | 0.31                                             | 0.00         | 0.00                 | 0.02                   | 0.33             | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2004        | 0        | 0        | 26.34                                            | 0.00         | 0.00                 | 0.15                   | 26.49            | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2005        | 0        | 0        | 40.91                                            | 0.00         | 0.00                 | 0.35                   | 41.26            | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2006        | 0        | 0        | 43.48                                            | 0.00         | 0.00                 | 0.57                   | 44.05            | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2007        | 0        | 0        | 71.85                                            | 0.00         | 0.00                 | 0.93                   | 72.78            | 0.00                                               | 0.00            | 0.00            | 0.00              | 0.00                   | 0.00               |
| 2008        | 0        | 0        | 125.75                                           | 0.00         | 0.00                 | 1.56                   | 127.31           | 0.30                                               | 3.83            | 0.00            | 0.02              | 0.00                   | 4.14               |
| 2009        | 0        | 0        | 139.98                                           | 0.00         | 0.00                 | 2.26                   | 142.24           | 0.60                                               | 5.74            | 0.00            | 0.05              | 0.00                   | 6.39               |
| 2010        | 0        | 0        | 221.77                                           | 0.00         | 0.00                 | 3.37                   | 225.13           | 3.57                                               | 11.48           | 0.00            | 0.13              | 0.00                   | 15.18              |
| 2011        | 0        | 0        | 287.38                                           | 0.00         | 0.00                 | 4.80                   | 292.19           | 3.57                                               | 19.13           | 0.00            | 0.24              | 0.00                   | 22.94              |
| 2012        | 0        | 0        | 284.26                                           | 0.00         | 0.00                 | 6.23                   | 290.49           | 17.87                                              | 114.76          | 0.00            | 0.90              | 0.00                   | 133.54             |
| 2013        | 0        | 0        | 235.70                                           | 0.00         | 0.00                 | 7.40                   | 243.10           | 16.68                                              | 156.85          | 0.00            | 1.77              | 0.00                   | 175.30             |
| 2014        | 0        | 0        | 234.07                                           | 0.00         | 0.00                 | 8.44                   | 242.65           | 16.68                                              | 250.57          | 0.00            | 3.11              | 0.00                   | 270.36             |
| 2015        | 150      | 2200     | 173.32                                           | 7.35         | 3.21                 | 9.44                   | 193.32           | 0.30                                               | 183.62          | 2.93            | 4.03              | 19.56                  | 210.44             |
| 2016        | 955      | 6800     | 50.02                                            | 22.05        | 3.21                 | 9.69                   | 84.97            | 0.00                                               | 19.13           | 2.93            | 4.12              |                        | 26.18              |
| 2017        | 1260     | 7000     | 9.39                                             | 23.39        | 3.21                 | 9.74                   | 45.72            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2018        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2019        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2020        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2021        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2022        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2023        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2024        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2025        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2026        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2027        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2028        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2029        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2030        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2031        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2032        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2033        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2034        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2035        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2036        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2037        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2038        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2039        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2040        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2041        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2042        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2043        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 3.83            | 2.93            | 4.12              |                        | 10.88              |
| 2044        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 5.74            | 2.93            | 4.12              |                        | 12.79              |
| 2045        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 11.48           | 2.93            | 4.12              |                        | 18.53              |
| 2046        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 19.13           | 2.93            | 4.12              |                        | 26.18              |
| 2047        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 114.76          | 2.93            | 4.12              |                        | 121.82             |
| 2048        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 156.85          | 2.93            | 4.12              |                        | 163.90             |
| 2049        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 250.57          | 2.93            | 4.12              |                        | 257.62             |
| 2050        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 183.62          | 2.93            | 4.12              |                        | 190.68             |
| 2051        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 19.13           | 2.93            | 4.12              |                        | 26.18              |
| 2052        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2053        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2054        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2055        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2056        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2057        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2058        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2059        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2060        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2061        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2062        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2063        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2064        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2065        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2066        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2067        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2068        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2069        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2070        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2071        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2072        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2073        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2074        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2075        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2076        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2077        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2078        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2079        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2080        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2081        | 1260     | 7000     | 0.00                                             | 23.39        | 3.44                 | 9.74                   | 36.57            | 0.00                                               | 0.00            | 2.93            | 4.12              |                        | 7.05               |
| 2082        | 1110     | 4800     | 0.00                                             | 16.04        | 0.23                 | 0.00                   | 16.27            | 0.00                                               | 0.00            | 0.00            | 0.00              |                        | 0.00               |
| 2083        | 305      | 400      | 0.00                                             | 1.34         | 0.23                 | 0.00                   | 1.57             | 0.00                                               | 0.00            | 0.00            | 0.00              |                        | 0.00               |
| 2084        | 0        | 0        | 0.00                                             | 0.00         | 0.00                 | 0.00                   | 0.00             | 0.00                                               | 0.00            | 0.00            | 0.00              |                        | 0.00               |

Total 2002 Base 84,420 469,000 1,947.55 1,566.93 230.27 688.29 4,433.05 59.58 1,530.20 196.34 282.40 19.56 2,088.07  
 Total 2002 P.V. 3,607 20,773 830.40 69.40 10.76 45.62 956.18 21.80 264.96 9.32 15.25 5.66 316.99

Adjusted for Losses @ 10%

| Levelized Energy Cost (2002 \$/MW h) @ SOUTH |       |      |  | Levelized Energy Cost (2002 \$/MW h) @ SOUTH |      |  |    |
|----------------------------------------------|-------|------|--|----------------------------------------------|------|--|----|
| Generation (capital, O&M, water rentals)     | 53.5  |      |  | Generation (capital only)                    | 44.0 |  |    |
| Transmission (capital, O&M)                  | 13.3  |      |  | Transmission Line (capital only)             | 1.2  |  |    |
| (Cost NPV / Energy NPV)                      | Total | 67.4 |  | Transmission Station (capital only)          | 14.0 |  |    |
|                                              |       |      |  | Total Capital                                | 59.2 |  |    |
|                                              |       |      |  | O&M                                          | 1.1  |  | </ |

Upper Bound Levelized Cost of Wind Generation in Manitoba  
Discount Rate: 10.00%

10.05 (cents/kWh)  
100.5 (\$/MWh)  
Average Energy: 110 GW h

Generating Costs: O&M Costs: 14.50 2002 \$ / MWh (includes \$1/MWh for land lease)  
\$80.5 M (1610.25 \$/kW) Variable Costs =  
Cdn 2002 Constant Dollars Fixed Costs = 2002 \$ Millions \$/yr  
In-Service Date = 2004  
Plant Characteristics: Life: 21 yrs  
MW (net output): 50,000 MW  
Capacity Factor: 25.00%

| Year | Capacity (MW) | Average Energy (GW h) | Generating Station (\$M) | Capital Tax (\$M) | Variable O&M Costs (\$M) | Generation TOTAL COST (\$M) |
|------|---------------|-----------------------|--------------------------|-------------------|--------------------------|-----------------------------|
| 2003 |               |                       | 20.13                    | 0.10              |                          | 20.23                       |
| 2004 | 50,000        | 63,800                | 60.38                    | 0.40              | 0.93                     | 61.71                       |
| 2005 | 50,000        | 110,000               |                          | 0.38              | 1.60                     | 1.98                        |
| 2006 | 50,000        | 110,000               |                          | 0.36              | 1.60                     | 1.96                        |
| 2007 | 50,000        | 110,000               |                          | 0.34              | 1.60                     | 1.94                        |
| 2008 | 50,000        | 110,000               |                          | 0.32              | 1.60                     | 1.92                        |
| 2009 | 50,000        | 110,000               |                          | 0.30              | 1.60                     | 1.90                        |
| 2010 | 50,000        | 110,000               |                          | 0.28              | 1.60                     | 1.88                        |
| 2011 | 50,000        | 110,000               |                          | 0.26              | 1.60                     | 1.86                        |
| 2012 | 50,000        | 110,000               |                          | 0.24              | 1.60                     | 1.84                        |
| 2013 | 50,000        | 110,000               |                          | 0.22              | 1.60                     | 1.82                        |
| 2014 | 50,000        | 110,000               |                          | 0.20              | 1.60                     | 1.80                        |
| 2015 | 50,000        | 110,000               |                          | 0.18              | 1.60                     | 1.78                        |
| 2016 | 50,000        | 110,000               |                          | 0.16              | 1.60                     | 1.76                        |
| 2017 | 50,000        | 110,000               |                          | 0.14              | 1.60                     | 1.74                        |
| 2018 | 50,000        | 110,000               |                          | 0.12              | 1.60                     | 1.72                        |
| 2019 | 50,000        | 110,000               |                          | 0.10              | 1.60                     | 1.70                        |
| 2020 | 50,000        | 110,000               |                          | 0.08              | 1.60                     | 1.68                        |
| 2021 | 50,000        | 110,000               |                          | 0.06              | 1.60                     | 1.66                        |
| 2022 | 50,000        | 110,000               |                          | 0.04              | 1.60                     | 1.64                        |
| 2023 | 50,000        | 110,000               |                          | 0.02              | 1.60                     | 1.62                        |
| 2024 |               | 46,200                |                          | 0.00              | 0.67                     | 0.67                        |
| 2025 |               |                       |                          |                   |                          |                             |
| 2026 |               |                       |                          |                   |                          |                             |
| 2027 |               |                       |                          |                   |                          |                             |
| 2028 |               |                       |                          |                   |                          |                             |
| 2029 |               |                       |                          |                   |                          |                             |
| 2030 |               |                       |                          |                   |                          |                             |
| 2031 |               |                       |                          |                   |                          |                             |
| 2032 |               |                       |                          |                   |                          |                             |
| 2033 |               |                       |                          |                   |                          |                             |
| 2034 |               |                       |                          |                   |                          |                             |
| 2035 |               |                       |                          |                   |                          |                             |

Year 2002 Base: \$1,000.00 \$2,250.00 \$80.51 \$31.80 \$150.74  
Year 2002 P.V.: 38.7 618 66,203 2,183 11,873 62,269

Lower Bound Levelized Costs of Wind Generation in Manitoba  
Discount Rate: 10.00%

6.85 (cents/kWh)  
68.5 (\$/MWh)  
Average Energy: 175 GW h

Generating Costs: O&M Costs: 14.50 2002 \$ / MWh (includes \$1/MWh for land lease)  
\$80.5 M (1610.25 \$/kW) Variable Costs =  
Cdn 2002 Constant Dollars Fixed Costs = 2002 \$ Millions \$/yr  
In-Service Date = 2004  
Plant Characteristics: Life: 21 yrs  
MW (net output): 50,000 MW  
Capacity Factor: 40.00%

| Year | Capacity (MW) | Average Energy (GW h) | Generating Station (\$M) | Capital Tax (\$M) | Variable O&M Costs (\$M) | Generation TOTAL COST (\$M) |
|------|---------------|-----------------------|--------------------------|-------------------|--------------------------|-----------------------------|
| 2003 |               |                       | 20.13                    | 0.10              |                          | 20.23                       |
| 2004 | 50,000        | 101,500               | 60.38                    | 0.40              | 1.47                     | 62.26                       |
| 2005 | 50,000        | 175,000               |                          | 0.38              | 2.54                     | 2.92                        |
| 2006 | 50,000        | 175,000               |                          | 0.36              | 2.54                     | 2.90                        |
| 2007 | 50,000        | 175,000               |                          | 0.34              | 2.54                     | 2.88                        |
| 2008 | 50,000        | 175,000               |                          | 0.32              | 2.54                     | 2.86                        |
| 2009 | 50,000        | 175,000               |                          | 0.30              | 2.54                     | 2.84                        |
| 2010 | 50,000        | 175,000               |                          | 0.28              | 2.54                     | 2.82                        |
| 2011 | 50,000        | 175,000               |                          | 0.26              | 2.54                     | 2.80                        |
| 2012 | 50,000        | 175,000               |                          | 0.24              | 2.54                     | 2.78                        |
| 2013 | 50,000        | 175,000               |                          | 0.22              | 2.54                     | 2.76                        |
| 2014 | 50,000        | 175,000               |                          | 0.20              | 2.54                     | 2.74                        |
| 2015 | 50,000        | 175,000               |                          | 0.18              | 2.54                     | 2.72                        |
| 2016 | 50,000        | 175,000               |                          | 0.16              | 2.54                     | 2.70                        |
| 2017 | 50,000        | 175,000               |                          | 0.14              | 2.54                     | 2.68                        |
| 2018 | 50,000        | 175,000               |                          | 0.12              | 2.54                     | 2.66                        |
| 2019 | 50,000        | 175,000               |                          | 0.10              | 2.54                     | 2.64                        |
| 2020 | 50,000        | 175,000               |                          | 0.08              | 2.54                     | 2.62                        |
| 2021 | 50,000        | 175,000               |                          | 0.06              | 2.54                     | 2.60                        |
| 2022 | 50,000        | 175,000               |                          | 0.04              | 2.54                     | 2.58                        |
| 2023 | 50,000        | 175,000               |                          | 0.02              | 2.54                     | 2.56                        |
| 2024 |               | 73,500                |                          | 0.00              | 1.07                     | 1.07                        |
| 2025 |               |                       |                          |                   |                          |                             |
| 2026 |               |                       |                          |                   |                          |                             |
| 2027 |               |                       |                          |                   |                          |                             |
| 2028 |               |                       |                          |                   |                          |                             |
| 2029 |               |                       |                          |                   |                          |                             |
| 2030 |               |                       |                          |                   |                          |                             |
| 2031 |               |                       |                          |                   |                          |                             |
| 2032 |               |                       |                          |                   |                          |                             |
| 2033 |               |                       |                          |                   |                          |                             |
| 2034 |               |                       |                          |                   |                          |                             |
| 2035 |               |                       |                          |                   |                          |                             |

Year 2002 Base: \$1,000.00 \$3,100.00 \$80.51 \$50.75 \$135.58  
Year 2002 P.V.: 38.7 1,303 66,203 2,183 15,889 69,285



## LEVELIZED COST OF: CCCT

### 1. PLANT CHARACTERISTICS

Annual Av. Capacity (@ South) = 248 MW      Discount Rate = 10.00%      Capacity Factor = 65%  
 Life = 30 years      In-Service-Date = 2009      Present Value Year = 2002

### 2. LEVELIZED COST BY ITEM

|        | Generation &<br>Transmission<br>Capital | Fixed<br>Costs | Variable<br>Costs<br>w/ low NG scen | Base<br>Cost | Incremental<br>High NG Price<br>scenario | Incremental<br>High Environ.<br>Premium | TOTAL |
|--------|-----------------------------------------|----------------|-------------------------------------|--------------|------------------------------------------|-----------------------------------------|-------|
| \$/MWh | 22.06                                   | 1.01           | 37.56                               | 60.63        | 8.32                                     | 10.24                                   | 79.19 |
| c/kWh  | 2.21                                    | 0.10           | 3.76                                | 6.06         | 0.83                                     | 1.02                                    | 7.92  |

### 3. CASHFLOW (mm CDN 2002 Base Dollars)

| Fiscal<br>Year | Plant Outputs @ South |                | Generation &<br>Transmission<br>Capital | Fixed<br>Costs | Variable<br>Costs<br>(w/ low NG scen) | Base<br>Cost | Incremental<br>High NG Price<br>scenario | Incremental<br>High Environ.<br>Premium | TOTAL  |
|----------------|-----------------------|----------------|-----------------------------------------|----------------|---------------------------------------|--------------|------------------------------------------|-----------------------------------------|--------|
| Req. Appl      | Average<br>MW         | Average<br>GWh |                                         |                |                                       |              |                                          |                                         |        |
| 2001           |                       |                |                                         |                |                                       |              |                                          |                                         |        |
| 2002           |                       |                |                                         |                |                                       |              |                                          |                                         |        |
| 2003           |                       |                |                                         |                |                                       |              |                                          |                                         |        |
| 2004           |                       |                |                                         |                |                                       |              |                                          |                                         |        |
| 2005           |                       |                |                                         |                |                                       |              |                                          |                                         |        |
| 2006           |                       |                | 28.15                                   |                |                                       | 28.15        |                                          |                                         | 28.15  |
| 2007           |                       |                | 188.31                                  |                |                                       | 188.31       |                                          |                                         | 188.31 |
| 2008           |                       |                | 52.25                                   |                |                                       | 52.25        |                                          |                                         | 52.25  |
| 2009           | 248                   | 1416           | 1.03                                    | 1.43           | 50.01                                 | 52.47        | 10.05                                    | 6.30                                    | 68.81  |
| 2010           | 248                   | 1416           |                                         | 1.43           | 50.53                                 | 51.97        | 10.98                                    | 7.91                                    | 70.85  |
| 2011           | 248                   | 1416           |                                         | 1.43           | 50.87                                 | 52.30        | 11.36                                    | 9.47                                    | 73.13  |
| 2012           | 248                   | 1416           |                                         | 1.43           | 51.23                                 | 52.66        | 10.41                                    | 11.02                                   | 74.09  |
| 2013           | 248                   | 1416           |                                         | 1.43           | 51.58                                 | 53.02        | 10.05                                    | 12.57                                   | 75.64  |
| 2014           | 248                   | 1416           |                                         | 1.43           | 51.95                                 | 53.38        | 9.69                                     | 14.13                                   | 77.20  |
| 2015           | 248                   | 1416           |                                         | 1.43           | 52.31                                 | 53.74        | 9.62                                     | 15.68                                   | 79.05  |
| 2016           | 248                   | 1416           |                                         | 1.43           | 52.68                                 | 54.11        | 10.45                                    | 16.46                                   | 81.02  |
| 2017           | 248                   | 1416           |                                         | 1.43           | 53.05                                 | 54.48        | 11.12                                    | 17.23                                   | 82.84  |
| 2018           | 248                   | 1416           |                                         | 1.43           | 53.42                                 | 54.86        | 12.83                                    | 18.01                                   | 85.70  |
| 2019           | 248                   | 1416           |                                         | 1.43           | 53.80                                 | 55.23        | 14.24                                    | 18.79                                   | 88.26  |
| 2020           | 248                   | 1416           |                                         | 1.43           | 54.18                                 | 55.61        | 14.61                                    | 19.57                                   | 89.79  |
| 2021           | 248                   | 1416           |                                         | 1.43           | 54.56                                 | 55.99        | 14.97                                    | 19.57                                   | 90.53  |
| 2022           | 248                   | 1416           |                                         | 1.43           | 54.95                                 | 56.38        | 15.33                                    | 19.57                                   | 91.28  |
| 2023           | 248                   | 1416           |                                         | 1.43           | 55.34                                 | 56.77        | 15.84                                    | 19.57                                   | 92.17  |
| 2024           | 248                   | 1416           |                                         | 1.43           | 55.73                                 | 57.16        | 15.44                                    | 19.57                                   | 92.17  |
| 2025           | 248                   | 1416           |                                         | 1.43           | 56.12                                 | 57.55        | 15.05                                    | 19.57                                   | 92.17  |
| 2026           | 248                   | 1416           |                                         | 1.43           | 56.52                                 | 57.95        | 14.65                                    | 19.57                                   | 92.17  |
| 2027           | 248                   | 1416           |                                         | 1.43           | 56.92                                 | 58.35        | 14.25                                    | 19.57                                   | 92.17  |
| 2028           | 248                   | 1416           |                                         | 1.43           | 57.33                                 | 58.76        | 13.85                                    | 19.57                                   | 92.17  |
| 2029           | 248                   | 1416           |                                         | 1.43           | 57.73                                 | 59.17        | 13.44                                    | 19.57                                   | 92.17  |
| 2030           | 248                   | 1416           |                                         | 1.43           | 58.15                                 | 59.58        | 13.03                                    | 19.57                                   | 92.17  |
| 2031           | 248                   | 1416           |                                         | 1.43           | 58.56                                 | 59.99        | 12.61                                    | 19.57                                   | 92.17  |
| 2032           | 248                   | 1416           |                                         | 1.43           | 58.98                                 | 60.41        | 12.20                                    | 19.57                                   | 92.17  |
| 2033           | 248                   | 1416           |                                         | 1.43           | 59.40                                 | 60.83        | 11.77                                    | 19.57                                   | 92.17  |
| 2034           | 248                   | 1416           |                                         | 1.43           | 59.82                                 | 61.25        | 11.35                                    | 19.57                                   | 92.17  |
| 2035           | 248                   | 1416           |                                         | 1.43           | 60.25                                 | 61.68        | 10.92                                    | 19.57                                   | 92.17  |
| 2036           | 248                   | 1416           |                                         | 1.43           | 60.68                                 | 62.11        | 10.49                                    | 19.57                                   | 92.17  |
| 2037           | 248                   | 1416           |                                         | 1.43           | 61.12                                 | 62.55        | 10.06                                    | 19.57                                   | 92.17  |
| 2038           | 248                   | 1416           |                                         | 1.43           | 61.12                                 | 62.55        | 10.06                                    | 19.57                                   | 92.17  |



## LEVELIZED COST OF: 2x NEW FUTURE SCCT

### 1. PLANT CHARACTERISTICS

Annual Av. Capacity (@ South) = 240 MW      Discount Rate = 10.00%      Capacity Factor = 65%  
 Life = 40 years      In-Service-Date = 2009  
                                  Present Value Year = 2002

### 2. LEVELIZED COST BY ITEM

|        | Generation & Transmission Capital | Fixed Costs | Variable Costs<br>w/ low NG scan | Base Cost | Incremental High NG Price scenario | Incremental High Environ. Premium | TOTAL  |
|--------|-----------------------------------|-------------|----------------------------------|-----------|------------------------------------|-----------------------------------|--------|
| \$/MWh | 12.43                             | 0.80        | 59.24                            | 72.47     | 13.49                              | 16.89                             | 102.85 |
| c/kWh  | 1.24                              | 0.08        | 5.92                             | 7.25      | 1.35                               | 1.69                              | 10.29  |

### 3. CASHFLOW (mm CDN 2002 Base Dollars)

| Fiscal Year<br>(beg. den) | Plant Outputs @ South<br>Average      Average<br>MW      GWh |      | Generation & Transmission Capital | Fixed Costs | Variable Costs<br>(w/ low NG scan) | Base Cost | Incremental High NG Price scenario | Incremental High Environ. Premium | TOTAL  |
|---------------------------|--------------------------------------------------------------|------|-----------------------------------|-------------|------------------------------------|-----------|------------------------------------|-----------------------------------|--------|
| 2001                      |                                                              |      |                                   |             |                                    |           |                                    |                                   |        |
| 2002                      |                                                              |      |                                   |             |                                    |           |                                    |                                   |        |
| 2003                      |                                                              |      |                                   |             |                                    |           |                                    |                                   |        |
| 2004                      |                                                              |      |                                   |             |                                    |           |                                    |                                   |        |
| 2005                      |                                                              |      |                                   |             |                                    |           |                                    |                                   |        |
| 2006                      |                                                              |      | 15.60                             |             |                                    | 15.60     |                                    |                                   | 15.60  |
| 2007                      |                                                              |      | 65.79                             |             |                                    | 65.79     |                                    |                                   | 65.79  |
| 2008                      |                                                              |      | 70.17                             |             |                                    | 70.17     |                                    |                                   | 70.17  |
| 2009                      | 240                                                          | 1367 | 5.27                              | 1.10        | 75.57                              | 81.93     | 15.81                              | 9.92                              | 107.66 |
| 2010                      | 240                                                          | 1367 |                                   | 1.10        | 76.40                              | 77.49     | 17.28                              | 12.45                             | 107.23 |
| 2011                      | 240                                                          | 1367 |                                   | 1.10        | 76.92                              | 78.02     | 17.89                              | 14.90                             | 110.81 |
| 2012                      | 240                                                          | 1367 |                                   | 1.10        | 77.48                              | 78.58     | 16.39                              | 17.35                             | 112.32 |
| 2013                      | 240                                                          | 1367 |                                   | 1.10        | 78.05                              | 79.15     | 15.82                              | 19.79                             | 114.76 |
| 2014                      | 240                                                          | 1367 |                                   | 1.10        | 78.62                              | 79.72     | 15.25                              | 22.24                             | 117.21 |
| 2015                      | 240                                                          | 1367 |                                   | 1.10        | 79.19                              | 80.29     | 15.15                              | 24.68                             | 120.12 |
| 2016                      | 240                                                          | 1367 |                                   | 1.10        | 79.77                              | 80.87     | 16.45                              | 25.91                             | 123.22 |
| 2017                      | 240                                                          | 1367 |                                   | 1.10        | 80.35                              | 81.45     | 17.51                              | 27.13                             | 126.09 |
| 2018                      | 240                                                          | 1367 |                                   | 1.10        | 80.94                              | 82.04     | 20.20                              | 28.35                             | 130.59 |
| 2019                      | 240                                                          | 1367 |                                   | 1.10        | 81.53                              | 82.63     | 22.42                              | 29.58                             | 134.63 |
| 2020                      | 240                                                          | 1367 |                                   | 1.10        | 82.13                              | 83.23     | 23.00                              | 30.80                             | 137.03 |
| 2021                      | 240                                                          | 1367 |                                   | 1.10        | 82.73                              | 83.83     | 23.57                              | 30.80                             | 138.20 |
| 2022                      | 240                                                          | 1367 |                                   | 1.10        | 83.34                              | 84.44     | 24.14                              | 30.80                             | 139.37 |
| 2023                      | 240                                                          | 1367 |                                   | 1.10        | 83.95                              | 85.05     | 24.93                              | 30.80                             | 140.78 |
| 2024                      | 240                                                          | 1367 |                                   | 1.10        | 84.57                              | 85.67     | 24.31                              | 30.80                             | 140.78 |
| 2025                      | 240                                                          | 1367 |                                   | 1.10        | 85.19                              | 86.29     | 23.69                              | 30.80                             | 140.78 |
| 2026                      | 240                                                          | 1367 |                                   | 1.10        | 85.82                              | 86.92     | 23.07                              | 30.80                             | 140.78 |
| 2027                      | 240                                                          | 1367 |                                   | 1.10        | 86.45                              | 87.55     | 22.43                              | 30.80                             | 140.78 |
| 2028                      | 240                                                          | 1367 |                                   | 1.10        | 87.09                              | 88.18     | 21.80                              | 30.80                             | 140.78 |
| 2029                      | 240                                                          | 1367 |                                   | 1.10        | 87.73                              | 88.83     | 21.16                              | 30.80                             | 140.78 |
| 2030                      | 240                                                          | 1367 |                                   | 1.10        | 88.38                              | 89.47     | 20.51                              | 30.80                             | 140.78 |
| 2031                      | 240                                                          | 1367 |                                   | 1.10        | 89.03                              | 90.13     | 19.86                              | 30.80                             | 140.78 |
| 2032                      | 240                                                          | 1367 |                                   | 1.10        | 89.69                              | 90.78     | 19.20                              | 30.80                             | 140.78 |
| 2033                      | 240                                                          | 1367 |                                   | 1.10        | 90.35                              | 91.45     | 18.54                              | 30.80                             | 140.78 |
| 2034                      | 240                                                          | 1367 |                                   | 1.10        | 91.02                              | 92.11     | 17.87                              | 30.80                             | 140.78 |
| 2035                      | 240                                                          | 1367 |                                   | 1.10        | 91.69                              | 92.79     | 17.19                              | 30.80                             | 140.78 |
| 2036                      | 240                                                          | 1367 |                                   | 1.10        | 92.37                              | 93.46     | 16.52                              | 30.80                             | 140.78 |
| 2037                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2038                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2039                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2040                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2041                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2042                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2043                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2044                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2045                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2046                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2047                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |
| 2048                      | 240                                                          | 1367 |                                   | 1.10        | 93.05                              | 94.15     | 15.83                              | 30.80                             | 140.78 |

## LEVELIZED COST OF: Coal

### 1. PLANT CHARACTERISTICS

Annual Av. Capacity (@ South) = 400 MW      Discount Rate = 10.00%      Capacity Factor = 65%  
 Life = 30 years      In-Service-Date = 2009  
 Present Value Year = 2002

### 2. LEVELIZED COST BY ITEM

|        | Generation & Transmission Capital | Fixed Costs | Variable Costs | Base Cost    | Incremental Technology Cost (IGCC-PC) | Incremental High Environ. Premium | TOTAL        |
|--------|-----------------------------------|-------------|----------------|--------------|---------------------------------------|-----------------------------------|--------------|
| \$/MWh | 37.56                             | 7.77        | 19.52          | <b>64.85</b> | 4.00                                  | 28.50                             | <b>97.36</b> |
| c/kWh  | 3.76                              | 0.78        | 1.95           | <b>6.49</b>  | 0.40                                  | 2.85                              | <b>9.74</b>  |

### 1. CASHFLOW (mm CDN 2002 Base Dollars)

| Fiscal Year | Plant Outputs @ South |             | Generation & Transmission Capital | Fixed Costs | Variable Costs | Base Cost | Incremental Technology Cost (IGCC-PC) | Incremental High Environ. Premium | TOTAL  |
|-------------|-----------------------|-------------|-----------------------------------|-------------|----------------|-----------|---------------------------------------|-----------------------------------|--------|
| Reg. April  | Average MW            | Average GWh |                                   |             |                |           |                                       |                                   |        |
| 2001        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2002        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2003        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2004        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2005        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2006        |                       |             |                                   |             |                |           |                                       |                                   |        |
| 2007        |                       |             | 129.42                            |             |                | 129.42    | 63.12                                 |                                   | 192.54 |
| 2008        |                       |             | 408.83                            |             |                | 408.83    | 210.14                                |                                   | 618.97 |
| 2009        | 400                   | 2279        | 281.41                            | 17.71       | 44.29          | 343.41    | 178.95                                | 32.43                             | 554.79 |
| 2010        | 400                   | 2279        |                                   | 17.71       | 44.40          | 62.11     | 31.96                                 | 41.47                             | 135.55 |
| 2011        | 400                   | 2279        |                                   | 17.71       | 44.38          | 62.09     | 31.96                                 | 47.09                             | 141.14 |
| 2012        | 400                   | 2279        |                                   | 17.71       | 44.38          | 62.09     | 31.96                                 | 52.71                             | 146.76 |
| 2013        | 400                   | 2279        |                                   | 17.71       | 44.38          | 62.09     | 31.96                                 | 58.33                             | 152.38 |
| 2014        | 400                   | 2279        |                                   | 17.71       | 44.38          | 62.09     | 31.96                                 | 63.95                             | 158.00 |
| 2015        | 400                   | 2279        |                                   | 17.71       | 44.38          | 62.09     | 31.96                                 | 69.57                             | 163.62 |
| 2016        | 400                   | 2279        |                                   | 17.71       | 44.44          | 62.16     | 31.98                                 | 72.38                             | 166.51 |
| 2017        | 400                   | 2279        |                                   | 17.71       | 44.51          | 62.22     | 32.00                                 | 75.19                             | 169.40 |
| 2018        | 400                   | 2279        |                                   | 17.71       | 44.57          | 62.28     | 32.01                                 | 78.00                             | 172.30 |
| 2019        | 400                   | 2279        |                                   | 17.71       | 44.63          | 62.34     | 32.03                                 | 80.81                             | 175.19 |
| 2020        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2021        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2022        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2023        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2024        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2025        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2026        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2027        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2028        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2029        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2030        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2031        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2032        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2033        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2034        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2035        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2036        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2037        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |
| 2038        | 400                   | 2279        |                                   | 17.71       | 44.70          | 62.41     | 32.05                                 | 83.62                             | 178.08 |

# DSM Costs from 2003

Net Present Value Year = 2001  
Discount 10%  
(2002-0811)

01 to 02 Convers 1.015

## Support & Contingency

|                     |          |
|---------------------|----------|
| <b>@ generation</b> |          |
| Levelized(\$/MWh)   | 2.80 015 |
| Levelized(c/kWh)    | 0.28 015 |
| Levelized(c/kWh)    | 0.28 025 |

|                    |          |
|--------------------|----------|
| <b>@ South Bus</b> |          |
| Gener to S Bus     | 10%      |
| Levelized(c/kWh)   | 0.31 025 |

| Original Values                       |        | Total       |
|---------------------------------------|--------|-------------|
| Total Contrib to Annual Energy (GW h) |        | Cost        |
| <b>@ generation</b>                   |        |             |
| 2001                                  | 0.00   |             |
| 2002                                  | 0.00   |             |
| 2003                                  | 59.52  | \$2,002,626 |
| 2004                                  | 124.04 | \$2,017,363 |
| 2005                                  | 189.91 | \$2,024,648 |
| 2006                                  | 241.88 | \$1,254,167 |
| 2007                                  | 290.63 | \$1,092,515 |
| 2008                                  | 337.36 | \$1,041,258 |
| 2009                                  | 377.09 | \$775,165   |
| 2010                                  | 413.20 | \$765,436   |
| 2011                                  | 445.12 | \$551,434   |
| 2012                                  | 468.71 | \$524,934   |
| 2013                                  | 492.47 | \$524,934   |
| 2014                                  | 518.31 | \$524,934   |
| 2015                                  | 543.09 | \$488,380   |
| 2016                                  | 568.39 | \$488,380   |
| 2017                                  | 596.86 | \$487,880   |
| 2018                                  | 617.59 | \$487,880   |
| 2019                                  | 637.36 | \$487,880   |
| 2020                                  | 656.91 | \$487,880   |
| 2021                                  | 649.10 | \$487,880   |
| 2022                                  | 632.95 | \$487,880   |
| 2023                                  | 609.74 | \$487,880   |
| 2024                                  | 584.89 | \$487,880   |
| 2025                                  | 560.16 | \$487,880   |
| 2026                                  | 544.68 | \$487,880   |
| 2027                                  | 533.23 | \$487,880   |
| 2028                                  | 525.37 | \$487,880   |
| 2029                                  | 526.75 | \$487,880   |
| 2030                                  | 530.61 | \$487,880   |
| 2031                                  | 530.61 | \$487,880   |
| 2032                                  | 530.61 | \$487,880   |
| 2033                                  | 530.61 | \$487,880   |
| 2034                                  | 530.61 | \$487,880   |
| 2035                                  | 530.61 | \$487,880   |
| 2036                                  | 530.61 | \$487,880   |
| 2037                                  | 530.61 | \$487,880   |
| 2038                                  | 530.61 | \$487,880   |

Totals 17,520.79 \$ 24,809,733  
PV Totals 3,269.38 \$ 9,155,589

## Lowest Cost Program

|                   |          |
|-------------------|----------|
| Program Lev Cost  | 1.52 025 |
| Support & Contn + | 0.31 025 |
| Total Low         | 1.83 025 |

|                   |           |
|-------------------|-----------|
| <b>@ meter</b>    |           |
| Levelized(\$/MWh) | 15.53 015 |
| Levelized(c/kWh)  | 1.55 015  |
| Levelized(c/kWh)  | 1.58 025  |

|                       |          |
|-----------------------|----------|
| <b>Meter to S Bus</b> |          |
| Levelized(c/kWh)      | 1.52 025 |

| Original Values                       |       | Total     |
|---------------------------------------|-------|-----------|
| Total Contrib to Annual Energy (GW h) |       | Cost      |
| <b>@ meter</b>                        |       |           |
| 2001                                  | 0.00  |           |
| 2002                                  | 0.00  |           |
| 2003                                  | 2.32  | \$348,603 |
| 2004                                  | 4.65  | \$348,603 |
| 2005                                  | 5.07  | \$50,060  |
| 2006                                  | 5.49  | \$34,797  |
| 2007                                  | 5.90  | \$34,797  |
| 2008                                  | 6.28  | \$31,228  |
| 2009                                  | 6.66  | \$31,228  |
| 2010                                  | 7.03  | \$31,228  |
| 2011                                  | 7.41  | \$31,228  |
| 2012                                  | 7.78  | \$31,228  |
| 2013                                  | 8.16  | \$31,228  |
| 2014                                  | 8.54  | \$31,228  |
| 2015                                  | 11.45 | \$241,798 |
| 2016                                  | 12.03 | \$241,798 |
| 2017                                  | 12.62 | \$241,798 |
| 2018                                  | 11.15 | \$70,487  |
| 2019                                  | 9.67  | \$70,487  |
| 2020                                  | 10.10 | \$70,487  |
| 2021                                  | 10.53 | \$70,487  |
| 2022                                  | 10.96 | \$70,487  |
| 2023                                  | 11.33 | \$62,160  |
| 2024                                  | 11.70 | \$62,160  |
| 2025                                  | 12.08 | \$62,160  |
| 2026                                  | 12.45 | \$62,160  |
| 2027                                  | 12.82 | \$62,160  |
| 2028                                  | 13.19 | \$62,160  |
| 2029                                  | 13.57 | \$62,160  |
| 2030                                  | 13.57 | \$62,160  |
| 2031                                  | 13.57 | \$241,798 |
| 2032                                  | 13.57 | \$241,798 |
| 2033                                  | 13.57 | \$70,487  |
| 2034                                  | 13.57 | \$70,487  |
| 2035                                  | 13.57 | \$70,487  |
| 2036                                  | 13.57 | \$70,487  |
| 2037                                  | 13.57 | \$70,487  |
| 2038                                  | 13.57 | \$62,160  |

373.02 \$ 3,508,755  
66.36 \$ 1,030,616

## Highest Cost Program

|                   |          |
|-------------------|----------|
| Program Lev Cost  | 6.85 025 |
| Support & Contn + | 0.31 025 |
| Total High        | 7.16 025 |

|                   |           |
|-------------------|-----------|
| <b>@ meter</b>    |           |
| Levelized(\$/MWh) | 70.15 015 |
| Levelized(c/kWh)  | 7.01 015  |
| Levelized(c/kWh)  | 7.12 025  |

|                       |          |
|-----------------------|----------|
| <b>Meter to S Bus</b> |          |
| Levelized(c/kWh)      | 6.85 025 |

| Original Values                       |      | Total     |
|---------------------------------------|------|-----------|
| Total Contrib to Annual Energy (GW h) |      | Cost      |
| <b>@ meter</b>                        |      |           |
| 2001                                  | 0.00 |           |
| 2002                                  | 0.00 |           |
| 2003                                  | 0.45 | \$321,838 |
| 2004                                  | 0.93 | \$333,992 |
| 2005                                  | 1.42 | \$346,147 |
| 2006                                  | 1.86 | \$150,856 |
| 2007                                  | 1.89 | \$145,856 |
| 2008                                  | 2.13 | \$145,856 |
| 2009                                  | 2.37 | \$145,856 |
| 2010                                  | 2.62 | \$158,011 |
| 2011                                  | 2.88 | \$158,011 |
| 2012                                  | 3.13 | \$158,011 |
| 2013                                  | 3.39 | \$158,011 |
| 2014                                  | 3.67 | \$170,166 |
| 2015                                  | 3.94 | \$170,166 |
| 2016                                  | 4.22 | \$170,166 |
| 2017                                  | 4.50 | \$170,166 |
| 2018                                  | 4.78 | \$177,458 |
| 2019                                  | 5.07 | \$177,458 |
| 2020                                  | 5.36 | \$177,458 |
| 2021                                  | 5.65 | \$177,458 |
| 2022                                  | 5.93 | \$177,458 |
| 2023                                  | 6.23 | \$182,320 |
| 2024                                  | 6.53 | \$182,320 |
| 2025                                  | 6.82 | \$182,320 |
| 2026                                  | 6.72 | \$182,320 |
| 2027                                  | 6.59 | \$182,320 |
| 2028                                  | 6.43 | \$182,320 |
| 2029                                  | 6.25 | \$182,320 |
| 2030                                  | 6.05 | \$182,320 |
| 2031                                  | 6.05 | \$182,320 |
| 2032                                  | 6.05 | \$182,320 |
| 2033                                  | 6.05 | \$182,320 |
| 2034                                  | 6.05 | \$182,320 |
| 2035                                  | 6.05 | \$182,320 |
| 2036                                  | 6.05 | \$182,320 |
| 2037                                  | 6.05 | \$182,320 |
| 2038                                  | 6.05 | \$182,320 |

166.03 \$ 6,707,524  
25.90 \$ 1,816,915

CAC/MSOS/NFAAT/S/2

**Comment on Appropriateness of using 2001 PowerSmart Plan under current export prices and market opportunities.**

Current DSM Plan

Manitoba Hydro's current approved DSM plan, the 2001 PowerSmart Plan, was developed based upon marginal cost values current in 2001, of which export prices are a component. Under this analysis, a number of economically feasible market attainable opportunities were identified and market/program strategies proposed, resulting in the current DSM targeted savings of 356 MW and 1272 GWh by 2011/12.

Changes within electricity markets throughout North America, as well as increasing environmental concerns, have led to increased interest in, and increased value of, potential DSM savings. In light of these changes, in 2002 Manitoba Hydro initiated a DSM Market Potential Study to reassess the maximum economically feasible market attainable DSM savings within Manitoba. This assessment values DSM savings according to Manitoba Hydro's latest export price assumptions used in the economic evaluation of Wuskwatim and all other resource options. While higher values on the export market will mean that previously uneconomic technologies may now become more economically feasible, this change does not necessarily result in a proportionate increase in the number of economic opportunities, nor will it necessarily result in an equivalent percentage increase in the market attainable savings. A technology may be theoretically economic and therefore worthwhile developing within the marketplace; however, there are a number of market barriers that these technologies may face and that will need to be addressed through individual program design (e.g. awareness, availability of qualified trade allies, etc.). The additional costs associated with this market intervention (e.g. program delivery, education, verification/quality control) will increase the economic cost of the DSM opportunity and in some cases may make it less attractive as a resource option.

1 Once the DSM Market Potential Study is finalized, a new formal DSM plan will be prepared. For  
2 the interim, Manitoba Hydro continues to use the 2001 DSM plan for operational purposes.  
3 Throughout detailed program design and implementation, projected DSM savings have not  
4 deviated substantially from the overall targets identified under the 2001 DSM plan as forecasted  
5 market adoption for some opportunities were slightly overstated and others slightly understated.  
6 In addition to the opportunities identified under the 2001 DSM plan, Manitoba Hydro has  
7 continued to explore additional economic opportunities as they emerge and add them to the DSM  
8 product mix (e.g. recently launched Commercial Chiller Program).

9  
10 Manitoba Hydro will continue to pursue all economically feasible, market attainable DSM  
11 opportunities which can be achieved without unacceptable rate impacts. The development of  
12 additional DSM, beyond levels currently forecast and used in the evaluation of Wuskwatim  
13 economics, is not incompatible with the development of Wuskwatim for 2009. Even if future  
14 levels of DSM were doubled from those currently forecast, the impact on Wuskwatim's IRR is  
15 only a reduction of 0.05%. See CAC/MSOS/NFAAT/S/6 for more details on the sensitivity of  
16 Wuskwatim economics to higher levels of DSM.

CCC/NFAAT/S/1

**Potential Impact of Standard Market Design (SMD) on Electricity Markets and on  
Manitoba Hydro's Export Market**

This section provides an update on recent developments in the U.S. Federal Energy Regulatory Commission (FERC) relating to its proposal on Standard Market Design (SMD). The implications of this initiative to Manitoba Hydro's export market potential and the expected accessibility of this market are assessed.

Background

On July 31, 2002, FERC issued a Notice of Proposed Rulemaking (NOPR) which would substantially alter the regulations governing the nation's wholesale electricity markets by establishing a common set of rules -- the Standard Market Design or SMD -- applicable to all U.S. public utilities that own, operate or control transmission facilities. FERC contended that these changes were necessary to remedy undue discrimination which lingers despite FERC's Order No. 888 (which initiated open access transmission) and subsequent related orders.

Manitoba Hydro's export power business benefited significantly from open access transmission under Order No. 888 as it allowed many more U.S. customers to access Manitoba's surplus hydro resources. Any further changes in the regulation of U.S. electricity markets that facilitate a more competitive market, such as the Standard Market Design is intended to be, are expected to benefit low cost suppliers such as Manitoba Hydro.

FERC's SMD proposal generated loud and somewhat unexpected opposition in a number of areas, such as FERC attempting to assert jurisdiction over areas traditionally under state responsibility. Lawmakers listened to the concerns, and Congress commissioned the U.S. Department of Energy (DOE) to do an independent study of the costs and benefits of SMD to the electricity markets. Insight into the impacts of the SMD proposal on the electricity markets for

1 potential future hydro developments in Manitoba can be determined from the DOE study. Note  
2 that the DOE study was conducted before FERC's April 28, 2003 White Paper on the new  
3 wholesale power market platform. While the White Paper softens some of the SMD proposals in  
4 a few areas, it does not materially alter the conclusions of the study. The Midwest Independent  
5 System Operator (MISO) is already well along in the process of developing its market rules  
6 consistent with the SMD proposal, and for the most part will continue to proceed on its current  
7 path regardless of the White Paper. Further information on recent developments relating to the  
8 White Paper are provided at the end of this section.

#### 10 The DOE Study on SMD

11 On April 30, 2003, the U.S. Department of Energy released its Report to Congress: Impacts of  
12 the Federal Energy Regulatory Commission's Proposal for Standard Market Design. Quantitative  
13 and qualitative approaches were used in the analysis of the impacts. The analysis consists of  
14 Non-SMD and SMD cases. The Non-SMD case projected a continuation of existing conditions,  
15 in which some large areas of the country had established centralized wholesale electricity  
16 markets and others do not. In the SMD case, FERC's SMD rulemaking would be finalized and  
17 all areas under FERC jurisdiction would establish fully competitive regional markets with  
18 SMD's basic features.

20 Following are the most relevant conclusions of the DOE study.

#### 22 1. Impacts on Wholesale Prices

- 23 • The average U.S. wide wholesale prices under SMD are estimated to decrease by  
24 about 1% in 2005 through 2010 and by about 2% from 2011 through 2015 relative to  
25 the Non-SMD case. However, the impacts vary significantly among regions.

27 For the MAPP Region (North Dakota, most of Minnesota, most of South Dakota,  
28 Western Iowa, Nebraska, and Eastern Montana – which is a good proxy for Manitoba  
29 Hydro's U.S. marketplace), average wholesale prices are estimated to increase by 10% in



1 the near term (2005-2010), from Non-SMD to the SMD Case. In the mid- term (2011-  
2 2015), wholesale electricity prices for the Non-SMD and SMD cases are expected to be  
3 the same. For the long term (2016-2020), wholesale prices in MAPP are expected to be  
4 1% lower for the SMD Case in comparison with the Non-SMD Case.

5  
6 In commenting on the MAPP Region, the DOE study stated:

- 7 • "MAPP is a net exporter. In the Non-SMD case, market inefficiencies prevent some  
8 of the available low-cost power from reaching more distant load centers. As a result,  
9 net exports increase in the SMD case, especially in the early years.
- 10  
11 • In the non-SMD case, MAPP is among the regions with the lowest wholesale prices.  
12 Wholesale prices rise in the near term with SMD due to the ability to reach higher  
13 priced markets, but the effect moderates within a few years."
- 14

15 2. Impacts on Security and Reliability of Generation and Transmission Infrastructure

16 The DOE study concluded that overall the U.S. electric system is very reliable today and  
17 would continue to be reliable under SMD. SMD would be unlikely to have adverse  
18 effects on reliability and could have several positive effects. In particular, a regional  
19 approach to transmission planning and related planning issues under SMD would  
20 improve the coordination among the State and regional resource agencies, which should  
21 result in investments to relieve transmission bottlenecks. Any improvements in the  
22 transmission grid within Manitoba Hydro's marketplace should benefit low cost suppliers  
23 such as Manitoba Hydro because they expand the marketplace, thus creating new  
24 opportunities for export sales and purchases.

25  
26 3. Implications for Future Hydro Development:

27 Near term (2005-2010): The increase in wholesale electricity price in the MAPP region  
28 under SMD as forecast by DOE in the near term period will have a positive impact on  
29 Manitoba Hydro's export revenues from existing facilities.



1        Mid and Long term (2011-2020): The DOE forecast indicates SMD will have minimal  
2        impact on wholesale electricity prices in MAPP in the mid to long term. A potential 1%  
3        decline in wholesale prices in the MAPP region in the long term is expected to be offset  
4        by the positive effect of new transmission investment and expanded opportunities in the  
5        marketplace. No discernable effect on prices from SMD is expected on Manitoba  
6        Hydro's U.S. marketplace in the long term.

7  
8        Manitoba Hydro's perspective on these DOE conclusions is that MAPP prices may be  
9        slightly less with SMD due to enhanced market efficiency. However, reduction in  
10       transmission bottlenecks and greater access to further markets will work in the opposite  
11       direction and may even more than affect the small 1% decline to yield an increase in  
12       MAPP prices due to SMD. Regardless of the uncertainty as to whether SMD will cause a  
13       small increase or decrease, it is expected by Manitoba Hydro that SMD will decrease the  
14       risks to Manitoba Hydro. SMD would reduce risks by reducing the chance of not being  
15       able to access higher price markets.

16  
17       The FERC White Paper on SMD and Update on Recent Developments

18       As noted in the Wuskwatim NFAAT submission, the U.S. Federal Energy Regulatory  
19       Commission's ("FERC") July 2002 Notice of Proposed Rulemaking ("NOPR") on Standard  
20       Market Design ("SMD") has caused much controversy in the U.S., particularly with regard to  
21       federal intrusion into traditional state authority. In the months following the issuance of the  
22       NOPR, considerable opposition was voiced by officials and elected representatives from western  
23       and southern U.S. states claiming that the net effect of the proposal would be to raise power  
24       prices in low-cost states.

25  
26       In addition, political pressure was applied at high levels in the U.S. Congress throughout the  
27       early months of 2003 leading to U.S. Senate Energy Committee Chairman Pete Domenici  
28       threatening to cut FERC's appropriations from Congress if the Commission did not soften its  
29       insistence on national standards.

1 The original Wuskwatim NFAAT submission had already anticipated that FERC would be  
2 pressured into stepping back from its original proposals of prescriptive national rules, and would  
3 be forced to modify its design to one that was regionally flexible, both in terms of details as well  
4 as the timing of implementation. This adjustment in approach by FERC has in fact occurred  
5 since the original submission was prepared.

6  
7 On April 28, 2003, FERC issued a White Paper which effectively ended the controversial  
8 standard market design in favour of a set of revisions now dubbed the "wholesale power market  
9 platform." Regional flexibility and increased participation from state and local authorities are  
10 heavily emphasized in the new document.

11  
12 In its final rule, according to the White Paper, the Commission will focus on the formation of  
13 regional transmission organizations ("RTOs") and ensuring that they have sound wholesale  
14 market rules. Implementation schedules will vary to allow for regional differences. The  
15 Commission will now rely on regional state committees to shape the market design features and  
16 give State commissions flexibility and decision-making power on issues such as transmission  
17 planning and resource adequacy. The document notes that FERC will not require that firm  
18 transmission rights be auctioned, and further notes that FERC no longer plans to extend its  
19 jurisdiction over the transmission rate component of bundled retail sales.

20  
21 Industry observers note that this compromise on the part of FERC still goes only part of the way  
22 to satisfying SMD's harshest critics. A Standard & Poor's survey of state utility commissioners  
23 recently noted that, although commissioners from the Midwest and states offering a degree of  
24 choice in electricity markets express guarded to neutral assessments of FERC's latest proposals,  
25 regulators from the U.S. south and west, plus regulated states, register opposition by margins as  
26 great as 10-1. The Alliance of State Leaders Protecting Electricity Consumers, which represents  
27 state regulators from the U.S. south and west, continue to insist that reliable service and  
28 affordable rates enjoyed by consumers in their regions remain at risk. The Alliance is adamant  
29 that the U.S. Congress must reaffirm states' authority to protect consumers, perhaps through

1 comprehensive energy legislation being considered by both the U.S. House of Representatives  
2 and the U.S. Senate.

3  
4 The U.S. Congress has been pursuing development of comprehensive legislation for a number of  
5 years, and the process continues in the current Congress. The U.S. House of Representatives  
6 finished its version of an energy bill in April 2003.

7  
8 The timing of a U.S. Senate energy bill is still in doubt, with numerous postponements occurring  
9 throughout spring and summer 2003. Senator Domenici has stated that FERC's White Paper  
10 "was not clear enough to be helpful" and raised more concerns than it allayed. The current  
11 Senate bill contains language which would bar FERC from completing its final rules before July  
12 2005, about two years later than FERC originally wanted. Assuming the completion of a Senate  
13 energy bill, the next step would see negotiators from both chambers of the Congress attempt to  
14 develop compromise legislation.

15  
16 In any event, it is likely that the final design for electricity markets in the United States will now  
17 be fashioned in gradual steps, by FERC and Congress encouragement of individual regional  
18 contributions.

19  
20 One example of these regional contributions would be the continued development of an  
21 electricity market under the auspices of the Midwest Independent Transmission System Operator  
22 ("MISO"), the RTO with which Manitoba Hydro maintains a coordination agreement. In late  
23 April 2003, MISO announced that its planned start-up date to open day-ahead and real-time  
24 energy markets in the U.S. Midwest was being postponed to March 31, 2004. The revised  
25 timeline is designed to accommodate additional training for market participants, as well as  
26 additional time to review and confirm the proposed market rules.

1 CAC/MSOS/NFAAT/S/3

2  
3 **Further Information on High and Low Export Price Forecasts and Historic Average Prices**

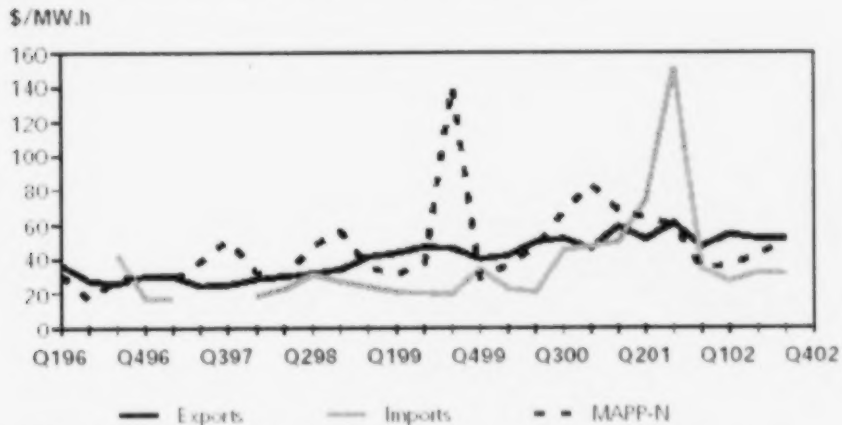
4  
5 This section provides further information on the High and Low export price forecasts and  
6 historic average export prices and how they compare to market prices as measured by an index of  
7 electricity prices in the U.S. In addition, equivalent natural gas prices corresponding to the Low  
8 and High forecasts is determined under the assumption that a combined cycle combustion turbine  
9 is utilized to produce electricity of the same characteristics as export power. A comparison of  
10 these natural gas prices to several forecasts of natural gas price is made. It is concluded that the  
11 Low and High electricity price forecasts are generally consistent with forecasts of equivalent  
12 natural gas prices.

13  
14 Forecasts and Historic Export Prices Compared to an Index for MAPP-North

15 The National Energy Board (NEB) of Canada has published a report "Canadian Electricity  
16 Exports and Imports - An Energy Market Assessment January 2003" that provides information  
17 on Manitoba Hydro's export and imports. This report states that "Manitoba export and import  
18 prices are generally in the same range as wholesale prices in MAPP-North, the northern part of  
19 the Mid-Continent Area Power Pool (Figure 3.5.2). Approximately 95 percent of exports from  
20 Manitoba are transacted through bilateral contracts. The long-term nature of these contracts  
21 results in Manitoba missing the highs and lows that tend to occur on the spot market, so  
22 Manitoba's average prices exhibit more stability than MAPP-N prices." The figure depicts the  
23 prices of Manitoba Hydro exports and imports from the first quarter of 1996 to the fourth quarter  
24 of 2002 all in current Canadian dollars. The figure also depicts the MAPP-North index, which is  
25 established by Power Markets Week and is for on-peak sales of 5x16 blocks of power.

FIGURE 3.5.2

**Manitoba Export and Import Prices vs. MAPP North\***



\* - Mid-Continent Area Power Pool - North

Source: NEB, PRA. MAPP-North prices are average on-peak prices (7:00 a.m. - 11:00 p.m., Monday to Saturday).

The NEB report also states "Manitoba's export prices have increased from an average of \$18 per MWh in 1990 to approximately \$51 per MWh in 2002." This price of \$51 in 2002 is consistent with the historic price provided in Figure 5.9, Chapter 5, Volume 1 of Need for and Alternatives to the Wuskwatim Project (NFAAT). As shown in Figure 3.5.2 above, the MAPP-North index of on-peak prices is a good indicator of Manitoba Hydro's average export prices.

The Low export price forecast was developed on the assumption that there would be no further increases in export prices into the long term. In this scenario all fundamental factors that drive up power prices would not occur into the long term. This assumption is considered to be conservative since all forecasts obtained by Manitoba Hydro projected that power prices would increase in real terms due to a variety of factors such as environmental considerations, use of more costly generation sources and expected real escalation in fuel.

The High export price forecast was developed on the assumption that a combination of fundamental factors that drive up power prices could occur concurrently into the long term. This

1 forecast is higher than the scenario with the highest environmental export premiums added to the  
2 reference price. The high forecast can result from factors such as high and volatile natural gas  
3 prices, extremely high environmental premiums, and high economic growth resulting in supply  
4 shortages.

5  
6 Natural Gas Prices Corresponding to Export Price Forecasts for Electricity

7 It is judged that there is a 5% probability that the export prices will equal or exceed the High  
8 export price forecast. Similarly, export prices can be expected to be equal or lower than the Low  
9 price forecast with a probability of 5%. In order to provide some context to the range of forecasts  
10 for electricity prices, the equivalent natural gas price was calculated assuming that a combined  
11 cycle combustion turbine is utilized to produce electricity of the same characteristics as export  
12 power.

13  
14 It was found that a natural gas price of \$3.10 per mmbtu (2002 U.S. \$) with no real escalation  
15 over time was required to produce a forecast similar to the Low. This price is lower than publicly  
16 available price forecasts for the post-2010 period. The National Energy Board's recent report  
17 entitled "Scenarios for Supply and Demand to 2025" published in July 2003, predicts natural gas  
18 prices of \$3.45 in 2010 with real escalation thereafter in the Supply Push Scenario (which is the  
19 scenario that results in low natural gas prices). The US Energy Information Administration in its  
20 Annual Energy Outlook 2003 predicts natural gas prices in excess of \$3.10. Even in its low  
21 economic growth case (which results in lower natural gas prices), prices are forecast to be \$3.18  
22 in 2010 and reach \$4.09 (in \$2002) by 2025. Most forecasts have real increases in natural gas  
23 prices over time because of increasing demand and the requirement to meet that demand from  
24 more remote supply basins or from offshore in liquid form, thus resulting in higher cost. Based  
25 on the above comparisons, a natural gas price forecast of less than \$3.10 per mmbtu with no real  
26 escalation for the next 25 years can be considered to be consistent with a 5% probability that was  
27 estimated for the low export price forecast.

28  
**August 08, 2003**



1 Similar to the Low export price forecast, a natural gas price was determined for the High export  
2 price forecast. This comparison may not be as meaningful since the high electricity price is  
3 largely influenced by premiums for environmental considerations. If the high scenario of  
4 environmental premiums is removed from the high forecast, it was determined that a natural gas  
5 price of \$5.15 per mmbtu (2002 U.S. \$) in the long term would be required for a combined cycle  
6 combustion turbine to be utilized to produce electricity of the same characteristics as export  
7 power. This price is well above the range of natural gas forecasts available to Manitoba Hydro  
8 and is consistent with a 5% probability of being exceeded that was estimated for the high export  
9 price forecast.

10  
11 Based on the above observations, it is concluded that the Low and High electricity price forecasts  
12 are generally consistent with forecasts of equivalent natural gas prices. In addition, it is  
13 concluded that the MAPP-North index is a reasonable indicator of Manitoba Hydro's average  
14 export prices.

August 08, 2003



CAC/MSOS/NFAAT/S/4

**Recent Load Growth Projections in MAPP-US and Supply Forecasts**

The following table compares load growth projections contained in the July 2002 MAPP Load and Capability Report with projections contained in the May 2003 2<sup>nd</sup> Draft of the 2003 MAPP Load and Capability Report. An extract of the Draft 2003 MAPP Load and Capability Report is provided in this Supplemental Filing (CAC/MSOS/NFAAT/S/4a). It provides information on future load growth, generation retirements and additions and transmission enhancements in the region central to Manitoba Hydro exports. The full report can be found on MAPP's website at [www.mapp.org/content/eia.shtml](http://www.mapp.org/content/eia.shtml).

**Table 1**  
**Forecasted Annual Net Energy Requirements and Seasonal System Demand**  
**In MAPP-US**  
**(2002 Load and Capability Report vs. 2003 Draft Load and Capability Report)**

|                    | Net Energy Requirements (GWh) |          | Summer System Demand (MW) |          |
|--------------------|-------------------------------|----------|---------------------------|----------|
|                    | 2002 L&C*                     | 2003 L&C | 2002 L&C                  | 2003 L&C |
| 2001 <sup>†</sup>  | 144,893                       | 144,893  | 28,321                    | 28,321   |
| 2002 <sup>†</sup>  | 150,058                       | 150,058  | 29,119                    | 29,119   |
| 2003               | 150,595                       | 157,518  | 28,382                    | 29,957   |
| 2004               | 157,110                       | 162,091  | 29,013                    | 30,555   |
| 2005               | 159,886                       | 165,604  | 29,507                    | 31,156   |
| 2006               | 163,170                       | 169,315  | 30,035                    | 31,763   |
| 2007               | 165,193                       | 172,163  | 30,604                    | 32,413   |
| 2008               | 167,768                       | 175,777  | 31,185                    | 33,022   |
| 2009               | 170,215                       | 178,570  | 31,866                    | 33,640   |
| 2010               | 172,696                       | 181,736  | 32,459                    | 34,228   |
| 2011               | 175,255                       | 184,702  | 33,022                    | 34,811   |
| 2012               |                               | 187,878  |                           | 35,383   |
| Increase (01 - 11) | 30,362                        | 39,809   | 4,701                     | 6,490    |
| AAC**: (01 - 11)   | 1.9%                          | 2.4%     | 1.5%                      | 2.1%     |

\*L&C = Load and Capability

\*\*AAC = Average Annual Change

<sup>†</sup> Values for 2001 and 2002 are actuals

The table illustrates that currently forecasted annual net energy requirements and seasonal system demand in MAPP-US have increased over the 2002 report. The 2003 draft report illustrates that both projected energy and demand requirements are 5.4% higher for 2011 than the projections for 2011 in the 2002 report. This increase in load is favourable to Manitoba Hydro since this provides more opportunity to export power. In order to obtain additional insight into the opportunity for export sales, it is necessary to investigate the expected resource additions in MAPP and the resulting surplus or deficit of power.

The MAPP Load and Capability Report includes an estimate of resources that are reported by the utilities as expected to be available in the future. Table 2 below provides a summary of supply and demand along with surplus or deficit for the period to 2012.

Table 2  
**Forecasted Seasonal (Summer) Capability and Capacity Obligation in MAPP-US (MW)**  
**(2002 Load and Capability Report vs. 2003 Draft Load and Capability Report)**

| Summer | 2002 L&C                     |                                     |                         | 2003 L&C                     |                                     |                         |
|--------|------------------------------|-------------------------------------|-------------------------|------------------------------|-------------------------------------|-------------------------|
|        | Adjusted Net Capability (MW) | Total Firm Capacity Obligation (MW) | Surplus or Deficit (MW) | Adjusted Net Capability (MW) | Total firm Capacity Obligation (MW) | Surplus or Deficit (MW) |
| 2002   | 32,196                       | 29,948                              | 2,248                   |                              |                                     |                         |
| 2003   | 32,173                       | 30,538                              | 1,635                   | 34,668                       | 32,764                              | 1,904                   |
| 2004   | 31,997                       | 31,301                              | 696                     | 34,229                       | 33,414                              | 815                     |
| 2005   | 31,635                       | 31,845                              | -210                    | 34,503                       | 33,991                              | 512                     |
| 2006   | 31,963                       | 32,455                              | -492                    | 34,456                       | 34,659                              | -203                    |
| 2007   | 32,488                       | 33,136                              | -648                    | 35,760                       | 35,377                              | 383                     |
| 2008   | 32,384                       | 33,710                              | -1,326                  | 35,895                       | 35,969                              | -74                     |
| 2009   | 33,144                       | 34,492                              | -1,348                  | 36,413                       | 36,658                              | -245                    |
| 2010   | 33,093                       | 35,171                              | -2,078                  | 36,407                       | 37,312                              | -905                    |
| 2011   | 33,172                       | 35,740                              | -2,568                  | 36,542                       | 37,888                              | -1,346                  |
| 2012   |                              |                                     |                         | 36,557                       | 38,524                              | -1,967                  |

**Sources:**  
MAPP Load and Capability Report 2002 – Section III-3  
MAPP Load and Capability Report 2003 (Draft 2) – Section III-3

However, the usefulness of this information more than several years out in time is limited because long-term plans are not usually provided by the reporting utilities and such information

1 is often considered proprietary. For example, the summary of supply/demand balance indicates  
2 that deficits in MAPP begin as early as 2006 and are as high as 2000 MW by 2012 for the 2003  
3 report.

4  
5 An alternative approach to using the MAPP Load and Capability Report is to assess what  
6 projects are likely to be developed in the future. An example of such an assessment is a  
7 Henwood Energy Services estimate that about 7500 MW of generating capacity is expected to be  
8 added to the MAPP area between 2002 and 2006. This has the effect of creating reserve margins  
9 as high as 25% in 2003 and reducing to 15% over this time period. This is generally consistent  
10 with the supply/demand MAPP Load and Capability Report for these early years. The significant  
11 additional resources in the early years results in an oversupply in the short term, but it is  
12 expected that load growth will overtake supply additions after this period of excess capacity and  
13 new resource additions will continue to be required.

14  
15 In general, the MidWest electricity markets have recently experienced significant new  
16 development of merchant power plants and this has resulted in significant excess capacity for the  
17 next several years. However, most of this excess is not in the MAPP region, but interconnectivity  
18 has the effect of suppressing prices in the entire region. As a result of the above conclusions,  
19 Henwood Energy Services has market price forecasts that do not increase significantly until  
20 about 2006 when the excess capacity due to oversupply is offset by load growth. In the longer  
21 term, electricity markets are forecast to move to an equilibrium situation in which new combined  
22 cycle entrants are able to recover all investment costs including debt costs and return on equity.

23  
24 Table 1 illustrates that the projected capacity and energy of the proposed Wuskwatim Generating  
25 Station (200 MW, 1520 GWh) is small relative to the projected size of the MAPP-US market of  
26 33,000 MW and 180,000 GWh. The annual load growth in 2010 is about 600 MW and 3000  
27 GWh. Therefore, the output of the Wuskwatim Generating Station is less than the load growth  
28 for half of one year in MAPP.

1 Load Growth in Nearby NERC Regions

2 Because the various electricity markets are somewhat interconnected, it is appropriate to obtain  
3 market information from neighbouring areas. Table 3 illustrates projected load growth for the  
4 North American Electric Reliability (NERC) regions Mid-Continent Area Power Pool (MAPP-  
5 US), Mid-American Interconnected Network (MAIN), and Southwest Power Pool (SPP). The  
6 total growth in the joint market area from 2001 – 2011 is 117,855 GW.h. or approximately 77  
7 times the projected average annual generation of Wuskwatim of 1520 GW.h.

Table 3  
Net Energy Requirements (GWh)

|         | Actual (2001) | Projected (2011) | Projected Average<br>Annual Growth | GW.h Increase<br>2001 - 2011 |
|---------|---------------|------------------|------------------------------------|------------------------------|
| MAPP-US | 144,893       | 175,255          | 1.9%                               | 30,362                       |
| MAIN    | 271,053       | 311,483          | 1.4%                               | 40,430                       |
| SPP     | 193,590       | 240,653          | 2.2%                               | 47,063                       |
| TOTAL   | 609,536       | 727,391          | 1.8%                               | 117,855                      |

Sources:

NERC Reliability Assessment 2002-2011 (October 2002)  
MAPP Load and Capability Report (July 2002)

**MID-CONTINENT AREA POWER POOL**  
**LOAD AND CAPABILITY**  
**REPORT**

**May 28, 2003**  
**2<sup>nd</sup> DRAFT**

QUESTIONS REGARDING THIS REPORT MAY BE DIRECTED TO:

MID-CONTINENT AREA POWER POOL  
MAPP Center  
1125 Energy Park Dr.  
St. Paul, MN 55108-5001  
(651) 632- 8400

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# **INTRODUCTION**

Section I



## GENERAL COMMENTS

The MAPP Load and Capability Report May 2003 is prepared in response to the requirement set forth in the MAPP Agreement and the MAPP Reliability Handbook for a two-year monthly and a ten-year seasonal load and capability forecast from each MAPP Participant. The report contains forecasts of monthly load and capability data for the period of May 2003 through December 2005 and seasonal load and capability data for the ten-year period Summer 2003 through Summer 2012.

The information in the report is dated May 31, 2003 and is prepared in conjunction with the May 1, 2003 MAPP Regional Reliability Council Report on Coordinated Bulk Power Supply Program (EIA-411) submitted to the North American Electric Reliability Council.

## MAPP RELIABILITY COUNCIL

The Mid-Continent Area Power Pool (MAPP) is one of the nine regional reliability councils comprising the North American Electric Reliability Council (NERC). The MAPP region covers all of the states of Minnesota, Nebraska, North Dakota, most of South Dakota, and portions of the states of Iowa, Illinois, Michigan, Missouri, Montana and Wisconsin. The Canadian provinces of Manitoba and Saskatchewan are included in the MAPP region as well. The region is outlined on the map of the NERC regional councils on page I-4.

MAPP oversees the planning and operating activities in the region with respect to reliability. MAPP membership now totals 108 members and includes 14 transmission-owning members, 48 transmission-using members, 77 Power and Energy Market members, 18 associate members, and 8 regulatory participants. Two of the municipal utilities, IAMU and MMUA, are Joint Members and each contains 4 End-Use Load reporting members. Manitoba Hydro is a Member and Saskatchewan Power Corporation is an Associate Member of MAPP.

Information pertaining to the electrical utilities within the MAPP region that are Associate Members of MAPP or non-MAPP members and to the non-utility generators in the MAPP region is incorporated in the report as appropriate. Information about non-utility generators was supplied through inquiries to and responses by MAPP Members, MAPP Associate Members, and non-MAPP member electric utilities in the MAPP region.

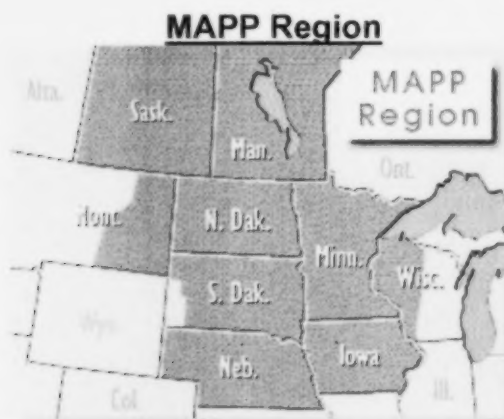
This overview of regional planning is a compilation of each Member's load forecasts, planned new facilities and the resulting generating capacity and reserves. The overall projected system is tested periodically according to criteria contained in the MAPP System Design Standards. These standards include a set of contingencies referred to as probable disturbances. The overall system must be capable of withstanding these disturbances without interruption of load due to instability or cascading. Another set of contingencies is referred to as extreme disturbances. The system is designed to minimize the spread of any interruption that might result from such extreme disturbances. These procedures provide the basis for reporting on advance planning in this document. Similarly, the overview of operating activities based upon System Operating Standards provides the basis for the operating data contained in this document.

# North American Electric Reliability Council



|              |                                                      |
|--------------|------------------------------------------------------|
| <b>ECAR</b>  | East Central Area Reliability Coordination Agreement |
| <b>ERCOT</b> | Electric Reliability Council of Texas                |
| <b>FRCC</b>  | Florida Reliability Coordinating Council             |
| <b>MAAC</b>  | Mid-Atlantic Area Council                            |
| <b>MAIN</b>  | Mid-America Interconnected Network                   |
| <b>MAPP</b>  | Mid-Continent Area Power Pool                        |
| <b>NPCC</b>  | Northeast Power Coordinating Council                 |
| <b>SERC</b>  | Southeastern Electric Reliability Council            |
| <b>SPP</b>   | Southwest Power Pool                                 |
| <b>WECC</b>  | Western Electricity Coordinating Council             |

|                  |                                     |
|------------------|-------------------------------------|
| <i>Affiliate</i> |                                     |
| <b>ASCC</b>      | Alaska Systems Coordinating Council |



## MID-CONTINENT AREA POWER POOL

### REPORTING SYSTEMS

| <u>SYSTEM NAME</u>                                                                                                                                                                                                                                  | <u>INITIALS</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Algona Municipal Utilities (1) .....                                                                                                                                                                                                                | ALGN            |
| Ames Municipal Electric System .....                                                                                                                                                                                                                | AMES            |
| Atlantic Municipal Utilities (1) .....                                                                                                                                                                                                              | ATL             |
| Basin Electric Power Cooperative .....                                                                                                                                                                                                              | BEPC            |
| Central Minnesota Municipal Power Agency (2) .....                                                                                                                                                                                                  | CMMPA           |
| GEN-SYS Energy (DPC) .....                                                                                                                                                                                                                          | GSE             |
| Great River Energy (CP & UPA) .....                                                                                                                                                                                                                 | GRE             |
| Harlan Municipal Utilities (1) .....                                                                                                                                                                                                                | HMU             |
| Hastings Utilities .....                                                                                                                                                                                                                            | HSTG            |
| Heartland Consumers Power District .....                                                                                                                                                                                                            | HCPD            |
| Hutchinson Utilities Commission (2) .....                                                                                                                                                                                                           | HUC             |
| Lincoln Electric System .....                                                                                                                                                                                                                       | LES             |
| Marshall Municipal Utilities .....                                                                                                                                                                                                                  | MMU             |
| MidAmerican Energy Company/ Corn Belt Power Cooperative/ Cedar Falls Municipal Utilities/<br>City of Indianola/ Montezuma Municipal Electric Utilities/ Estherville Ia./ Waverly Ia./North Iowa<br>Municipal Electric Cooperative Association ..... | MEC             |
| Minnesota Municipal Power Agency .....                                                                                                                                                                                                              | MMPA            |
| Minnesota Power .....                                                                                                                                                                                                                               | MP              |
| Minnkota Power Cooperative Inc. ....                                                                                                                                                                                                                | MPC             |
| Missouri River Energy Services .....                                                                                                                                                                                                                | MRES            |
| Montana-Dakota Utilities Co. ....                                                                                                                                                                                                                   | MDU             |
| Municipal Energy Agency of Nebraska .....                                                                                                                                                                                                           | MEAN            |
| Muscatine Power & Water .....                                                                                                                                                                                                                       | MPW             |
| Nebraska Public Power District .....                                                                                                                                                                                                                | NPPD            |
| New Ulm Public Utilities (2) .....                                                                                                                                                                                                                  | NULM            |
| Northwestern Public Service Company .....                                                                                                                                                                                                           | NWPS            |
| Omaha Public Power District .....                                                                                                                                                                                                                   | OPPD            |
| Otter Tail Power Company .....                                                                                                                                                                                                                      | OTP             |
| Pella Municipal Power and Light Department (1) .....                                                                                                                                                                                                | PELLA           |
| Rochester Public Utilities .....                                                                                                                                                                                                                    | RPU             |
| Southern Minnesota Municipal Power Agency .....                                                                                                                                                                                                     | SMMPA           |
| Western Area Power Administration – Upper Great Plains Region .....                                                                                                                                                                                 | WAPA            |
| Willmar Municipal Utilities (2) .....                                                                                                                                                                                                               | WLMR            |
| Wisconsin Public Power Inc. ....                                                                                                                                                                                                                    | WPPI            |
| Xcel Energy .....                                                                                                                                                                                                                                   | XCEL            |
| <br>Manitoba Hydro .....                                                                                                                                                                                                                            | <br>MHEB        |
| SaskPower .....                                                                                                                                                                                                                                     | SPC             |

(1) Joint Member through Iowa Association of Municipal Utilities (IAMU)

(2) Joint Member through Minnesota Municipal Utilities Association (MMUA)

## EXPLANATION OF CODES – Section IV

### I. UNIT TYPES

|    |                                                               |
|----|---------------------------------------------------------------|
| CA | Combined Cycle Steam Turbine Portion                          |
| CC | Combined Cycle Total Unit                                     |
| CE | Compressed Air Energy Storage                                 |
| CT | Combined Cycle Combustion Turbine Portion                     |
| CS | Combined Cycle Single Shaft                                   |
| FC | Fuel Cell                                                     |
| GT | Combustion (Gas) Turbine (includes jet engine design)         |
| HY | Hydraulic Turbine - Conventional                              |
| IC | Internal Combustion (piston)                                  |
| NA | Unknown at this time                                          |
| OT | Other (describe in "notes")                                   |
| PS | Hydraulic Turbine - Pumped Storage                            |
| PV | Photovoltaic                                                  |
| ST | Steam Turbine, including nuclear, geothermal, and solar steam |
| WT | Wind Turbine                                                  |

### II. FUEL TYPES

|     |                                       |
|-----|---------------------------------------|
| BFG | Blast-Furnace Gas                     |
| BIT | Bituminous                            |
| DFO | Distillate Fuel Oil                   |
| GEO | Geothermal                            |
| JF  | Jet Fuel                              |
| KER | Kerosene                              |
| LFG | Landfill Gas                          |
| LIG | Lignite                               |
| MSW | Municipal Solid Waste                 |
| NA  | Not Available                         |
| NG  | Natural Gas                           |
| NUC | Nuclear (Uranium, Plutonium, Thorium) |
| OBG | Other Biomass Gases                   |
| OBL | Other Biomass Liquids                 |
| OBS | Other Biomass Solids                  |
| OG  | Other Gas                             |
| PC  | Petroleum Coke                        |
| PG  | Propane                               |
| RFO | Residual Fuel Oil                     |
| SUB | Sub bituminous                        |
| SUN | Solar                                 |
| WAT | Water                                 |
| WC  | Waste/Other Coal                      |
| WDL | Wood Waste Liquids                    |
| WDS | Wood/Wood Waste Solids                |
| WH  | Waste Heat (reject heat)              |
| WND | Wind                                  |
| WO  | Oil – Other than Waste Oil            |

## EXPLANATION OF CODES – Section IV

### III. STATUS CODES

#### Utility Units:

|    |                                                                                                                                                                                              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OP | Operating, available to operate, or on short-term scheduled or forced outage (less than three months).                                                                                       |
| OS | On long-term scheduled (maintenance) or forced outage; not available to operate (greater than three months).                                                                                 |
| SB | Cold standby (Reserve): deactivated (mothballed), in long-term storage and cannot be made available for service in a short period of time, usually requires three to six months to activate. |
| RE | Retired (no longer in service and not expected to be returned to service).                                                                                                                   |
| A  | Generating unit capability increased (rerated or relicensed)                                                                                                                                 |
| CO | Proposed Change of Ownership                                                                                                                                                                 |
| D  | Generating unit capability decreased (rerated or relicensed)                                                                                                                                 |
| FC | Existing generator planned for conversion to another fuel or energy source                                                                                                                   |
| IP | Planned generator indefinitely postponed or canceled                                                                                                                                         |
| L  | Regulatory approval pending. Not under construction (started site preparation).                                                                                                              |
| M  | Generating unit put in deactivated shutdown status                                                                                                                                           |
| OT | Other (describe under "notes")                                                                                                                                                               |
| P  | Planned for installation but not utility-authorized. Not under construction.                                                                                                                 |
| RA | Previously deactivated or retired generator planned for reactivation                                                                                                                         |
| RP | Proposed for repowering or life extension                                                                                                                                                    |
| RT | Existing generator scheduled for retirement                                                                                                                                                  |
| T  | Regulatory approval received but not under construction.                                                                                                                                     |
| TS | Construction complete, but not yet in commercial operation (including low power testing of nuclear units).                                                                                   |
| U  | Under construction, less than or equal to 50% complete (based on construction time to first electric date).                                                                                  |
| V  | Under construction, more than 50% complete (based on construction time to first electric date).                                                                                              |

# **MONTHLY LOAD AND CAPABILITY DATA**

Section II



## MONTHLY LOAD AND CAPABILITY

May 2003 through December 2005

|                                                                                                                                                                                                                                   |            |
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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

MAPP - US

|                                                                                    | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 23423       | 27528       | 29886       | 29212       | 25774       | 21124       | 22211       | 23557       | 23843       | 23011       | 21563       | 20758       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 23423       | 27528       | 29886       | 29212       | 25774       | 21124       | 22211       | 23557       | 23843       | 23011       | 21563       | 20758       |
| 4 Direct Control Load Management                                                   | 24          | 71          | 71          | 74          | 27          | 80          | 181         | 336         | 348         | 346         | 188         | 58          |
| 5 Interruptible Demand                                                             | 221         | 545         | 1257        | 1190        | 220         | 220         | 220         | 220         | 220         | 220         | 220         | 220         |
| 6 Net Internal Demand (3-4-5)                                                      | 23178       | 26912       | 28557       | 27968       | 25527       | 20824       | 21810       | 23001       | 23275       | 22445       | 21155       | 20480       |
| 7 Schedule L Purchases                                                             | 220         | 220         | 220         | 220         | 220         | 275         | 335         | 465         | 475         | 475         | 345         | 244         |
| 8 Committed Resources (9+10+11+12)                                                 | 31478       | 31733       | 31655       | 31657       | 31865       | 31780       | 31877       | 31981       | 32095       | 32072       | 32037       | 31962       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3408        | 3454        | 3455        | 3440        | 3432        | 3391        | 3318        | 3311        | 3331        | 3341        | 3390        | 3400        |
| 10 Other Capacity (1 MW or greater)                                                | 27949       | 28196       | 28076       | 28094       | 28311       | 28265       | 28436       | 28546       | 28640       | 28607       | 28523       | 28139       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           |
| 12 Other Capacity (less than 1 MW)                                                 | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         |
| 13 Uncommitted Resources                                                           | 786         | 1088        | 1084        | 1083        | 1083        | 1083        | 1083        | 1083        | 1083        | 1083        | 1084        | 1085        |
| 14 Total Capacity (8+13)                                                           | 32243       | 32799       | 32719       | 32720       | 32949       | 32864       | 32981       | 33064       | 33178       | 33158       | 33122       | 32747       |
| 15 Inoperable Capacity                                                             | 39          | 0           | 0           | 0           | 7           | 7           | 7           | 7           | 7           | 0           | 0           | 161         |
| 16 Net Operable Capacity (14-15)                                                   | 32204       | 32799       | 32719       | 32720       | 32942       | 32857       | 32954       | 33057       | 33171       | 33158       | 33122       | 32586       |
| 17 Total Capacity Purchases                                                        | 5262        | 5777        | 6130        | 6056        | 5310        | 5014        | 3705        | 3654        | 3650        | 3732        | 3624        | 3636        |
| 18 Full Responsibility Purchases (Firm)                                            | 1189        | 1381        | 1731        | 1685        | 1272        | 1146        | 1049        | 1200        | 1358        | 1137        | 1039        | 949         |
| 19 Participation Purchases                                                         | 4073        | 4416        | 4399        | 4401        | 4037        | 3869        | 2656        | 2654        | 2592        | 2595        | 2565        | 2567        |
| 20 Total Capacity Sales                                                            | 2996        | 3883        | 3950        | 3947        | 3505        | 2935        | 3314        | 3470        | 3520        | 3369        | 3176        | 3024        |
| 21 Full Responsibility Sales                                                       | 988         | 1243        | 1493        | 1469        | 1198        | 978         | 1143        | 1298        | 1367        | 1216        | 1123        | 1043        |
| 22 Participation Sales                                                             | 2008        | 2440        | 2457        | 2458        | 2307        | 1957        | 2171        | 2172        | 2153        | 2153        | 2053        | 1981        |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 34476       | 34699       | 34904       | 34835       | 34752       | 34942       | 33351       | 33447       | 33607       | 33525       | 33576       | 33104       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 34314       | 34781       | 34696       | 34669       | 34686       | 34781       | 33451       | 33552       | 33623       | 33604       | 33660       | 33359       |
| 26 Annual System Demand                                                            | 28634       | 28573       | 29917       | 29911       | 29852       | 29794       | 29805       | 29872       | 29856       | 29845       | 29836       | 29817       |
| 27 Monthly Adjusted Net Demand (6-7-16+21)                                         | 22976       | 26794       | 28319       | 27782       | 25453       | 20857       | 21904       | 23099       | 23284       | 22524       | 21239       | 20574       |
| 28 Annual Adjusted Net Demand (26-16+21)                                           | 28433       | 28455       | 29679       | 29745       | 29778       | 29627       | 29699       | 29970       | 29965       | 29924       | 29920       | 29911       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 4137        | 4138        | 4353        | 4352        | 4330        | 4315        | 4392        | 4402        | 4387        | 4393        | 4395        | 4397        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 27145       | 30932       | 32672       | 32135       | 29785       | 24999       | 26316       | 27518       | 27688       | 26934       | 25653       | 24996       |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 7170        | 3849        | 1995        | 2535        | 4900        | 9762        | 7135        | 6034        | 5934        | 6670        | 8008        | 8361        |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

**MAPP - US**

|                                                                                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 23997       | 28132       | 30476       | 29823       | 26277       | 21567       | 22599       | 23964       | 24248       | 23327       | 21962       | 21001       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 23997       | 28132       | 30476       | 29823       | 26277       | 21567       | 22599       | 23964       | 24248       | 23327       | 21962       | 21001       |
| 4 Direct Control Load Management                                                   | 24          | 72          | 73          | 75          | 27          | 86          | 187         | 346         | 369         | 367         | 199         | 63          |
| 5 Interruptible Demand                                                             | 221         | 545         | 1272        | 1205        | 220         | 220         | 220         | 220         | 220         | 220         | 220         | 220         |
| 6 Net Internal Demand (3-4-5)                                                      | 23752       | 27518       | 29131       | 28544       | 26030       | 21262       | 22192       | 23418       | 23669       | 22750       | 21543       | 20718       |
| 7 Schedule L Purchases                                                             | 220         | 220         | 220         | 220         | 220         | 280         | 340         | 475         | 495         | 485         | 355         | 248         |
| 8 Committed Resources (9+10+11+12)                                                 | 32030       | 31849       | 31728       | 31730       | 31939       | 31842       | 31934       | 32037       | 32084       | 32062       | 32027       | 31652       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3419        | 3464        | 3465        | 3480        | 3442        | 3394        | 3321        | 3314        | 3333        | 3343        | 3392        | 3402        |
| 10 Other Capacity (1 MW or greater)                                                | 28498       | 28262       | 28139       | 28157       | 28374       | 28324       | 28469       | 28599       | 28625       | 28595       | 28511       | 28127       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           | 8           |
| 12 Other Capacity (less than 1 MW)                                                 | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         |
| 13 Uncommitted Resources                                                           | 1175        | 1205        | 1203        | 1203        | 1218        | 1230        | 1229        | 1229        | 1446        | 1446        | 1638        | 1638        |
| 14 Total Capacity (8+13)                                                           | 33205       | 33055       | 32931       | 32932       | 33196       | 33072       | 33183       | 33266       | 33630       | 33608       | 33664       | 33290       |
| 15 Inoperable Capacity                                                             | 0           | 0           | 0           | 0           | 369         | 0           | 0           | 0           | 0           | 0           | 377         | 77          |
| 16 Net Operable Capacity (14-15)                                                   | 33205       | 33055       | 32931       | 32932       | 32788       | 33072       | 33183       | 33266       | 33630       | 33608       | 33287       | 33213       |
| 17 Total Capacity Purchases                                                        | 4629        | 4686        | 5043        | 4967        | 4312        | 4253        | 3413        | 3668        | 3331        | 3111        | 3006        | 2914        |
| 18 Full Responsibility Purchases (Firm)                                            | 1146        | 1283        | 1654        | 1577        | 1198        | 1123        | 1045        | 1202        | 1370        | 1147        | 1061        | 962         |
| 19 Participation Purchases                                                         | 3382        | 3403        | 3389        | 3391        | 3117        | 3130        | 2368        | 2366        | 1961        | 1964        | 1944        | 1952        |
| 20 Total Capacity Sales                                                            | 2443        | 3093        | 3491        | 3467        | 3044        | 2496        | 2628        | 2686        | 2377        | 2225        | 2132        | 2051        |
| 21 Full Responsibility Sales                                                       | 895         | 1146        | 1396        | 1362        | 1101        | 886         | 1100        | 1256        | 1350        | 1198        | 1105        | 1026        |
| 22 Participation Sales                                                             | 1548        | 1947        | 2095        | 2005        | 1943        | 1610        | 1428        | 1429        | 1027        | 1027        | 1027        | 1025        |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 35296       | 34655       | 34499       | 34418       | 34062       | 34834       | 34054       | 34156       | 34491       | 34400       | 34167       | 34082       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 35045       | 34517       | 34232       | 34234       | 34337       | 34597       | 34109       | 34210       | 34471       | 34452       | 34598       | 34223       |
| 26 Annual System Demand                                                            | 29856       | 29938       | 30470       | 30493       | 30444       | 30376       | 30386       | 30454       | 30436       | 30417       | 30384       | 30383       |
| 27 Monthly Adjusted Net Demand (6-7-16+21)                                         | 23500       | 27379       | 29873       | 28360       | 25936       | 21025       | 22247       | 23472       | 23649       | 22802       | 21597       | 20781       |
| 28 Annual Adjusted Net Demand (26-16+21)                                           | 29805       | 29801       | 30213       | 30309       | 30351       | 30139       | 30443       | 30508       | 30418       | 30488       | 30437       | 30426       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 4313        | 4340        | 4433        | 4437        | 4416        | 4392        | 4474        | 4483        | 4470        | 4475        | 4473        | 4475        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 27841       | 31719       | 33306       | 32796       | 30353       | 25444       | 26738       | 27973       | 28135       | 27292       | 26087       | 25282       |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 7204        | 2799        | 926         | 1437        | 3983        | 9154        | 7371        | 6237        | 6336        | 7160        | 8512        | 8941        |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

MAPP-D/S

|                                                                                    | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 24494       | 28698       | 31088       | 30408       | 26917       | 22038       | 22929       | 24326       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 24494       | 28698       | 31088       | 30408       | 26917       | 22038       | 22929       | 24326       |
| 4 Direct Control Load Management                                                   | 25          | 73          | 74          | 76          | 28          | 82          | 192         | 357         |
| 5 Interruptible Demand                                                             | 221         | 564         | 1310        | 1243        | 220         | 220         | 220         | 220         |
| 6 Net Internal Demand (3-4-5)                                                      | 24248       | 28061       | 29704       | 29060       | 26669       | 21736       | 22517       | 23749       |
| 7 Schedule L Purchases                                                             | 220         | 220         | 220         | 220         | 220         | 277         | 345         | 485         |
| 8 Committed Resources (9+10+11+12)                                                 | 31973       | 31857       | 31738       | 31737       | 31946       | 31843       | 31934       | 32037       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3420        | 3471        | 3473        | 3457        | 3449        | 3396        | 3323        | 3316        |
| 10 Other Capacity (1 MW or greater)                                                | 28429       | 28262       | 28139       | 28157       | 28374       | 28325       | 28489       | 28599       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 115         | 115         | 115         | 115         | 115         | 114         | 114         | 114         |
| 13 Uncommitted Resources                                                           | 1638        | 1633        | 1630        | 1630        | 1641        | 1641        | 1640        | 1640        |
| 14 Total Capacity (8+13)                                                           | 33810       | 33499       | 33386       | 33367       | 33587       | 33484       | 33575       | 33678       |
| 15 Inoperable Capacity                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 33810       | 33499       | 33386       | 33367       | 33587       | 33484       | 33575       | 33678       |
| 17 Total Capacity Purchases                                                        | 3391        | 3549        | 3906        | 3829        | 3427        | 3373        | 2832        | 2989        |
| 18 Full Responsibility Purchases (Firm)                                            | 1113        | 1247        | 1617        | 1539        | 1159        | 1093        | 1014        | 1172        |
| 19 Participation Purchases                                                         | 2277        | 2302        | 2288        | 2290        | 2268        | 2281        | 1818        | 1817        |
| 20 Total Capacity Sales                                                            | 1585        | 2267        | 2515        | 2511        | 2224        | 1878        | 2015        | 2173        |
| 21 Full Responsibility Sales                                                       | 630         | 1075        | 1325        | 1321        | 1030        | 619         | 1057        | 1214        |
| 22 Participation Sales                                                             | 1055        | 1192        | 1190        | 1190        | 1194        | 1057        | 958         | 959         |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (18+17+23-20)                                        | 35121       | 34778       | 34763       | 34691       | 34796       | 34986       | 34398       | 34500       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 34838       | 34806       | 34470       | 34472       | 34667       | 34713       | 34441       | 34542       |
| 26 Annual System Demand                                                            | 30421       | 30509       | 31062       | 31077       | 31031       | 30980       | 30974       | 31039       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 23965       | 27889       | 29411       | 28872       | 26540       | 21463       | 22580       | 23791       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 30137       | 30336       | 30770       | 30668       | 30903       | 30687       | 31017       | 31081       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 4393        | 4420        | 4516        | 4510        | 4498        | 4474        | 4560        | 4569        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 28357       | 32310       | 33927       | 33391       | 31039       | 25952       | 27137       | 28379       |
| 31 Surplus or Deficit (-) Capacity (25-30)                                         | 6452        | 2297        | 543         | 1082        | 3828        | 8750        | 7304        | 6163        |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

MAFP-Canada

|                                                                                    | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 5178        | 5313        | 5347        | 5519        | 5221        | 5441        | 6066        | 6661        | 6729        | 6489        | 5994        | 5384        |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 5178        | 5313        | 5347        | 5519        | 5221        | 5441        | 6066        | 6661        | 6729        | 6489        | 5994        | 5384        |
| 4 Direct Control Load Management                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 5 Interruptible Demand                                                             | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         |
| 6 Net Internal Demand (3-4-5)                                                      | 4910        | 5045        | 5079        | 5251        | 4953        | 5173        | 5798        | 6393        | 6461        | 6221        | 5726        | 5116        |
| 7 Schedule L Purchases                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 8 Committed Resources (9+10+11+12)                                                 | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8565        | 8573        | 8616        |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 10 Other Capacity (1 MW or greater)                                                | 9043        | 8889        | 8871        | 8913        | 8946        | 9070        | 8670        | 8631        | 8587        | 8565        | 8572        | 8616        |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 13 Uncommitted Resources                                                           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 14 Total Capacity (8+13)                                                           | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8565        | 8573        | 8616        |
| 15 Inoperable Capacity                                                             | 373         | 358         | 85          | 241         | 364         | 408         | 85          | 0           | 0           | 286         | 286         | 434         |
| 16 Net Operable Capacity (14-15)                                                   | 8671        | 8532        | 8786        | 8672        | 8583        | 8663        | 8585        | 8631        | 8587        | 8279        | 8287        | 8182        |
| 17 Total Capacity Purchases                                                        | 0           | 0           | 0           | 0           | 0           | 50          | 550         | 550         | 550         | 550         | 550         | 500         |
| 18 Full Responsibility Purchases (Firm)                                            | 0           | 0           | 0           | 0           | 0           | 50          | 550         | 550         | 550         | 550         | 550         | 500         |
| 19 Participation Purchases                                                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 20 Total Capacity Sales                                                            | 1760        | 1760        | 1760        | 1760        | 1760        | 1710        | 810         | 810         | 810         | 810         | 810         | 810         |
| 21 Full Responsibility Sales                                                       | 750         | 750         | 750         | 750         | 750         | 700         | 0           | 0           | 0           | 0           | 0           | 0           |
| 22 Participation Sales                                                             | 1010        | 1010        | 1010        | 1010        | 1010        | 1010        | 810         | 810         | 810         | 810         | 810         | 810         |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 6911        | 6772        | 7026        | 6912        | 6823        | 7003        | 8325        | 8371        | 8327        | 8019        | 8027        | 7872        |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 8034        | 7879        | 7881        | 7903        | 7937        | 8061        | 7860        | 7821        | 7777        | 7755        | 7763        | 7806        |
| 26 Annual System Demand                                                            | 6601        | 6601        | 6601        | 6601        | 6601        | 6601        | 6601        | 6623        | 6626        | 6626        | 6626        | 6626        |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 5960        | 5795        | 5829        | 6001        | 5703        | 5823        | 5248        | 5943        | 5911        | 5671        | 5170        | 4616        |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 7351        | 7351        | 7351        | 7351        | 7351        | 7251        | 6051        | 6273        | 6276        | 6276        | 6276        | 6326        |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 878         | 878         | 878         | 878         | 878         | 863         | 743         | 776         | 776         | 776         | 776         | 754         |
| 30 Total Firm Capacity Obligation (27+29)                                          | 6837        | 6673        | 6707        | 6879        | 6590        | 6686        | 5901        | 6619        | 6667        | 6447        | 5953        | 5400        |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 1496        | 1206        | 1154        | 1024        | 1356        | 1374        | 1870        | 1202        | 1069        | 1308        | 1810        | 2406        |

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MEGAWATTS

MAPP-Canada

|                                                                                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 5250        | 5394        | 5432        | 5615        | 5298        | 5523        | 6171        | 6772        | 6812        | 6582        | 6088        | 5474        |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 5250        | 5394        | 5432        | 5615        | 5298        | 5523        | 6171        | 6772        | 6812        | 6582        | 6088        | 5474        |
| 4 Direct Control Load Management                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 5 Interruptible Demand                                                             | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         |
| 6 Net Internal Demand (3-4-5)                                                      | 4982        | 5126        | 5164        | 5347        | 5030        | 5255        | 5903        | 6504        | 6544        | 6314        | 5820        | 5206        |
| 7 Schedule L Purchases                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 8 Committed Resources (9+10+11+12)                                                 | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8505        | 8573        | 8616        |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 10 Other Capacity (1 MW or greater)                                                | 9043        | 8889        | 8871        | 8913        | 8946        | 9070        | 8670        | 8631        | 8587        | 8505        | 8572        | 8616        |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 13 Uncommitted Resources                                                           | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8505        | 8573        | 8616        |
| 14 Total Capacity (8+13)                                                           | 273         | 154         | 0           | 79          | 341         | 365         | 147         | 0           | 62          | 224         | 85          | 380         |
| 15 Inoperable Capacity                                                             | 6771        | 8735        | 8871        | 8835        | 8806        | 8886        | 8523        | 8631        | 8625        | 8341        | 8488        | 8236        |
| 16 Net Operable Capacity (14-15)                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 500         | 500         | 500         | 500         | 500         | 500         |
| 17 Total Capacity Purchases                                                        | 0           | 0           | 0           | 0           | 0           | 0           | 500         | 500         | 500         | 500         | 500         | 500         |
| 18 Full Responsibility Purchases (Firm)                                            | 0           | 0           | 0           | 0           | 0           | 0           | 500         | 500         | 500         | 500         | 500         | 500         |
| 19 Participation Purchases                                                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 20 Total Capacity Sales                                                            | 1510        | 1510        | 1510        | 1510        | 1510        | 1510        | 810         | 810         | 810         | 810         | 810         | 810         |
| 21 Full Responsibility Sales                                                       | 500         | 500         | 500         | 500         | 500         | 500         | 0           | 0           | 0           | 0           | 0           | 0           |
| 22 Participation Sales                                                             | 1010        | 1010        | 1010        | 1010        | 1010        | 1010        | 810         | 810         | 810         | 810         | 810         | 810         |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 7261        | 7225        | 7381        | 7325        | 7096        | 7176        | 8213        | 8321        | 8215        | 8031        | 8178        | 7926        |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 8034        | 7879        | 7881        | 7903        | 7937        | 8061        | 7980        | 7821        | 7777        | 7755        | 7763        | 7806        |
| 26 Annual System Demand                                                            | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        | 6826        |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 5482        | 5626        | 5604        | 5847        | 5530        | 5755        | 5403        | 6004        | 6044        | 5814        | 5320        | 4706        |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        | 7326        |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 884         | 884         | 884         | 884         | 884         | 884         | 884         | 884         | 884         | 884         | 884         | 884         |
| 30 Total Firm Capacity Obligation (27+29)                                          | 6386        | 6510        | 6548        | 6731        | 6414        | 6639        | 6187        | 6798        | 6839        | 6608        | 6113        | 5800        |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 1668        | 1389        | 1313        | 1172        | 1523        | 1422        | 1673        | 1023        | 938         | 1147        | 1649        | 2306        |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

MAPP-Canada

|                                                                                    | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 5323        | 5476        | 5521        | 5707        | 5374        | 5594        | 6269        | 5879        |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 5323        | 5476        | 5521        | 5707        | 5374        | 5594        | 6269        | 5879        |
| 4 Direct Control Load Management                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 5 Interruptible Demand                                                             | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         |
| 6 Net Internal Demand (3-4-5)                                                      | 5055        | 5208        | 5253        | 5439        | 5106        | 5326        | 6001        | 5611        |
| 7 Schedule L Purchases                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 8 Committed Resources (9+10+11+12)                                                 | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 10 Other Capacity (1 MW or greater)                                                | 9043        | 8889        | 8871        | 8913        | 8946        | 9070        | 8670        | 8631        |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 13 Uncommitted Resources                                                           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 14 Total Capacity (8+13)                                                           | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        |
| 15 Inoperable Capacity                                                             | 505         | 356         | 224         | 228         | 425         | 461         | 264         | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 8539        | 8532        | 8647        | 8686        | 8519        | 8610        | 8396        | 8631        |
| 17 Total Capacity Purchases                                                        | 0           | 0           | 0           | 0           | 0           | 0           | 500         | 500         |
| 18 Full Responsibility Purchases (Firm)                                            | 0           | 0           | 0           | 0           | 0           | 0           | 500         | 500         |
| 19 Participation Purchases                                                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 20 Total Capacity Sales                                                            | 1289        | 1289        | 1289        | 1289        | 1289        | 1289        | 789         | 789         |
| 21 Full Responsibility Sales                                                       | 500         | 500         | 500         | 500         | 500         | 500         | 0           | 0           |
| 22 Participation Sales                                                             | 789         | 789         | 789         | 789         | 789         | 789         | 789         | 789         |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 7250        | 7243        | 7358        | 7397        | 7230        | 7321        | 8097        | 8342        |
| 25 Adjusted Net Capacity (14+19+23-22)                                             | 8255        | 8100        | 8062        | 8124        | 8158        | 8252        | 7881        | 7842        |
| 26 Annual System Demand                                                            | 6893        | 6893        | 6893        | 6893        | 6893        | 6893        | 6893        | 6893        |
| 27 Monthly Adjusted Net Demand (8-7-18+21)                                         | 5555        | 5708        | 5753        | 5939        | 5606        | 5826        | 5901        | 6111        |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 7393        | 7393        | 7393        | 7393        | 7393        | 7393        | 6393        | 6480        |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 894         | 894         | 894         | 894         | 894         | 894         | 794         | 806         |
| 30 Total Firm Capacity Obligation (27+29)                                          | 6449        | 6802        | 6647        | 6833        | 6500        | 6720        | 6295        | 6917        |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 1805        | 1498        | 1435        | 1292        | 1658        | 1562        | 1587        | 925         |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

**MAPP-Total**

|                                                                                 | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|---------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                   | 28600       | 32841       | 35233       | 34732       | 30995       | 26566       | 28277       | 30218       | 30573       | 29500       | 27557       | 28142       |
| 2 Standby Demand                                                                | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                         | 28600       | 32841       | 35233       | 34732       | 30995       | 26566       | 28277       | 30218       | 30573       | 29500       | 27557       | 28142       |
| 4 Direct Control Load Management                                                | 24          | 71          | 71          | 74          | 27          | 80          | 181         | 336         | 348         | 348         | 188         | 56          |
| 5 Interruptible Demand                                                          | 489         | 813         | 1525        | 1458        | 488         | 488         | 458         | 488         | 488         | 488         | 488         | 488         |
| 6 Net Internal Demand (3-4-5)                                                   | 28087       | 31957       | 33636       | 33200       | 30480       | 25998       | 27608       | 29394       | 29737       | 28666       | 26881       | 25596       |
| 7 Schedule L Purchases                                                          | 220         | 220         | 220         | 220         | 220         | 275         | 335         | 465         | 475         | 475         | 345         | 244         |
| 8 Committed Resources (9+10+11+12)                                              | 40521       | 40622       | 40526       | 40570       | 40812       | 40851       | 40547       | 40612       | 40681       | 40637       | 40610       | 40278       |
| 9 Distributed Generator Capacity (1 MW or greater)                              | 3406        | 3454        | 3455        | 3440        | 3432        | 3391        | 3318        | 3311        | 3331        | 3341        | 3390        | 3400        |
| 10 Other Capacity (1 MW or greater)                                             | 36992       | 37045       | 36947       | 37007       | 37257       | 37336       | 37106       | 37177       | 37226       | 37172       | 37096       | 36755       |
| 11 Distributed Generator Capacity (less than 1 MW)                              | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           |
| 12 Other Capacity (less than 1 MW)                                              | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 116         | 115         | 115         |
| 13 Uncommitted Resources                                                        | 766         | 1066        | 1064        | 1083        | 1083        | 1083        | 1083        | 1083        | 1083        | 1083        | 1084        | 1085        |
| 14 Total Capacity (8+13)                                                        | 41287       | 41689       | 41590       | 41633       | 41896       | 41934       | 41631       | 41695       | 41765       | 41720       | 41694       | 41363       |
| 15 Inoperable Capacity                                                          | 412         | 358         | 85          | 241         | 371         | 415         | 92          | 7           | 7           | 286         | 286         | 595         |
| 16 Net Operable Capacity (14-15)                                                | 40875       | 41331       | 41505       | 41392       | 41525       | 41519       | 41539       | 41688       | 41758       | 41434       | 41408       | 40768       |
| 17 Total Capacity Purchases                                                     | 5262        | 5777        | 6130        | 6066        | 6310        | 5064        | 4255        | 4404        | 4500        | 4282        | 4174        | 4036        |
| 18 Full Responsibility Purchases (Firm)                                         | 1189        | 1361        | 1731        | 1655        | 1272        | 1196        | 1599        | 1750        | 1908        | 1687        | 1589        | 1449        |
| 19 Participation Purchases                                                      | 4073        | 4416        | 4399        | 4401        | 4037        | 3869        | 2656        | 2654        | 2592        | 2595        | 2585        | 2587        |
| 20 Total Capacity Sales                                                         | 4756        | 5443        | 5710        | 5707        | 5265        | 4645        | 4124        | 4280        | 4330        | 4179        | 3986        | 3834        |
| 21 Full Responsibility Sales                                                    | 1738        | 1993        | 2243        | 2239        | 1948        | 1678        | 1143        | 1298        | 1367        | 1216        | 1123        | 1043        |
| 22 Participation Sales                                                          | 3018        | 3450        | 3467        | 3468        | 3317        | 2967        | 2981        | 2982        | 2963        | 2963        | 2863        | 2791        |
| 23 Adjustment for Remotely Located (totally owned or shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                     | 41387       | 41670       | 41931       | 41748       | 41575       | 41944       | 41676       | 41819       | 41934       | 41544       | 41603       | 40976       |
| 25 Adjusted Net Capability (14+19+23-22)                                        | 42348       | 42690       | 42528       | 42573       | 42622       | 42842       | 41311       | 41373       | 41400       | 41359       | 41423       | 41165       |
| 26 Annual System Demand                                                         | 35235       | 35174       | 36518       | 36512       | 36453       | 36395       | 36406       | 36695       | 36682       | 36671       | 36662       | 36843       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                      | 28636       | 32589       | 34148       | 33784       | 31155       | 26480       | 27152       | 28941       | 29195       | 28195       | 26415       | 25190       |
| 28 Annual Adjusted Net Demand (26-18+21)                                        | 35784       | 35806       | 37030       | 37096       | 37129       | 36878       | 35950       | 36243       | 36141       | 36200       | 36197       | 36237       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                   | 5014        | 5016        | 5230        | 5230        | 5207        | 5178        | 5135        | 5178        | 5163        | 5169        | 5171        | 5181        |
| 30 Total Firm Capacity Obligation (27+29)                                       | 33682       | 37605       | 39379       | 39014       | 36365       | 31685       | 32306       | 34137       | 34376       | 33381       | 31605       | 30398       |
| 31 Surplus or Deficit (-) Capacity (25-30)                                      | 8666        | 5055        | 3149        | 3559        | 6256        | 11157       | 9005        | 7237        | 7024        | 7978        | 9618        | 10767       |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

MAPP-Total

|                                                                                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 29246       | 33526       | 35907       | 35439       | 31575       | 27090       | 28770       | 30756       | 31081       | 29909       | 28049       | 26474       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 29246       | 33526       | 35907       | 35439       | 31575       | 27090       | 28770       | 30756       | 31081       | 29909       | 28049       | 26474       |
| 4 Direct Control Load Management                                                   | 24          | 72          | 73          | 75          | 27          | 66          | 187         | 346         | 359         | 367         | 199         | 63          |
| 5 Interruptible Demand                                                             | 489         | 613         | 1540        | 1473        | 488         | 466         | 438         | 438         | 438         | 438         | 438         | 438         |
| 6 Net Internal Demand (3-4-5)                                                      | 28733       | 32642       | 34295       | 33891       | 31060       | 26517       | 28095       | 29922       | 30214       | 29064       | 27362       | 25823       |
| 7 Schedule L Purchases                                                             | 220         | 220         | 220         | 220         | 220         | 280         | 340         | 475         | 485         | 485         | 355         | 248         |
| 8 Committed Resources (9+10+11+12)                                                 | 41074       | 40738       | 40599       | 40643       | 40885       | 40913       | 40804       | 40668       | 40671       | 40827       | 40600       | 40268       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3419        | 3464        | 3485        | 3450        | 3442        | 3394        | 3321        | 3314        | 3333        | 3343        | 3392        | 3402        |
| 10 Other Capacity (1 MW or greater)                                                | 37531       | 37151       | 37010       | 37070       | 37320       | 37395       | 37159       | 37230       | 37214       | 37180       | 37084       | 36743       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           | 9           |
| 12 Other Capacity (less than 1 MW)                                                 | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 115         | 116         | 115         | 115         |
| 13 Uncommitted Resources                                                           | 1175        | 1205        | 1203        | 1203        | 1218        | 1230        | 1229        | 1229        | 1446        | 1446        | 1636        | 1636        |
| 14 Total Capacity (8+13)                                                           | 42248       | 41944       | 41802       | 41846       | 42103       | 42143       | 41833       | 41897       | 42117       | 42073       | 42237       | 41908       |
| 15 Inoperable Capacity                                                             | 273         | 154         | 0           | 78          | 710         | 385         | 147         | 0           | 62          | 224         | 482         | 457         |
| 16 Net Operable Capacity (14-15)                                                   | 41975       | 41790       | 41802       | 41768       | 41393       | 41758       | 41686       | 41897       | 42055       | 41849       | 41775       | 41449       |
| 17 Total Capacity Purchases                                                        | 4529        | 4686        | 5043        | 4967        | 4312        | 4253        | 3913        | 4068        | 3831        | 3811        | 3506        | 3414        |
| 18 Full Responsibility Purchases (Firm)                                            | 1146        | 1263        | 1654        | 1577        | 1195        | 1123        | 1545        | 1702        | 1970        | 1647        | 1551        | 1462        |
| 19 Participation Purchases                                                         | 3382        | 3403        | 3389        | 3391        | 3117        | 3130        | 2368        | 2366        | 1961        | 1964        | 1954        | 1952        |
| 20 Total Capacity Sales                                                            | 3953        | 4603        | 5001        | 4997        | 4554        | 4006        | 3338        | 3495        | 3187        | 3035        | 2942        | 2961        |
| 21 Full Responsibility Sales                                                       | 1395        | 1546        | 1696        | 1662        | 1601        | 1386        | 1100        | 1256        | 1350        | 1198        | 1105        | 1026        |
| 22 Participation Sales                                                             | 2558        | 2957        | 3105        | 3105        | 2953        | 2620        | 2238        | 2239        | 1837        | 1837        | 1837        | 1835        |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 8           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 42557       | 41880       | 41850       | 41744       | 41157       | 42010       | 42267       | 42477       | 42705       | 42431       | 42345       | 42008       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 43078       | 42396       | 42093       | 42137       | 42273       | 42658       | 41969       | 42031       | 42247       | 42207       | 42361       | 42029       |
| 26 Annual System Demand                                                            | 36662       | 36764       | 37297       | 37320       | 37271       | 37203       | 37215       | 37350       | 37331       | 37310       | 37277       | 37256       |
| 27 Monthly Adjusted Net Demand (6-7-16+21)                                         | 28962       | 33005       | 34537       | 34207       | 31466       | 26780       | 27650       | 29476       | 29694       | 28616       | 26916       | 25487       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 38931       | 37127       | 37539       | 37635       | 37677       | 37466       | 36769       | 36904       | 36811       | 36861       | 36830       | 36819       |
| 29 Net Reserve Capacity Obligation (26 x 15%)                                      | 5198        | 5224        | 5316        | 5320        | 5299        | 5276        | 5257        | 5277        | 5264        | 5268        | 5266        | 5268        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 34206       | 38229       | 38653       | 39527       | 38767       | 32082       | 32925       | 34771       | 34973       | 33900       | 32200       | 30781       |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 8872        | 4166        | 2239        | 2610        | 5506        | 10575       | 9044        | 7260        | 7274        | 8307        | 10161       | 11247       |

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**FORECASTED MONTHLY LOAD & CAPABILITY**  
MEGAWATTS

**MAPP-Total**

|                                                                                    | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 29817       | 34174       | 36609       | 36115       | 32291       | 27632       | 29198       | 31205       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 29817       | 34174       | 36609       | 36115       | 32291       | 27632       | 29198       | 31205       |
| 4 Direct Control Load Management                                                   | 25          | 73          | 74          | 76          | 28          | 82          | 192         | 357         |
| 5 Interruptible Demand                                                             | 489         | 832         | 1578        | 1511        | 488         | 488         | 488         | 488         |
| 6 Net Internal Demand (3-4-5)                                                      | 29303       | 33269       | 34957       | 34529       | 31775       | 27062       | 28518       | 30360       |
| 7 Schedule L Purchases                                                             | 220         | 220         | 220         | 220         | 220         | 277         | 345         | 485         |
| 8 Committed Resources (9+10+11+12)                                                 | 41018       | 40746       | 40607       | 40651       | 40893       | 40914       | 40804       | 40689       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3420        | 3471        | 3473        | 3457        | 3449        | 3396        | 3323        | 3316        |
| 10 Other Capacity (1 MW or greater)                                                | 37472       | 37151       | 37010       | 37070       | 37320       | 37395       | 37159       | 37230       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 9           | 9           | 9           | 9           | 9           | 9           |
| 12 Other Capacity (less than 1 MW)                                                 | 115         | 115         | 115         | 115         | 115         | 114         | 114         | 114         |
| 13 Uncommitted Resources                                                           | 1638        | 1633        | 1630        | 1630        | 1641        | 1641        | 1640        | 1640        |
| 14 Total Capacity (8+13)                                                           | 42654       | 42379       | 42237       | 42280       | 42534       | 42554       | 42245       | 42309       |
| 15 Inoperable Capacity                                                             | 505         | 358         | 224         | 228         | 428         | 461         | 284         | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 42149       | 42021       | 42013       | 42053       | 42106       | 42093       | 41961       | 42309       |
| 17 Total Capacity Purchases                                                        | 3391        | 3549        | 3906        | 3829        | 3427        | 3373        | 3332        | 3489        |
| 18 Full Responsibility Purchases (Firm)                                            | 1113        | 1247        | 1817        | 1539        | 1159        | 1093        | 1514        | 1672        |
| 19 Participation Purchases                                                         | 2277        | 2302        | 2288        | 2290        | 2268        | 2281        | 1818        | 1817        |
| 20 Total Capacity Sales                                                            | 3174        | 3596        | 3804        | 3800        | 3513        | 3165        | 2804        | 2962        |
| 21 Full Responsibility Sales                                                       | 1330        | 1575        | 1825        | 1821        | 1530        | 1319        | 1057        | 1214        |
| 22 Participation Sales                                                             | 1844        | 1981        | 1979        | 1979        | 1983        | 1846        | 1747        | 1748        |
| 23 Adjustment for Remotely Located (totally owned or<br>shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 42371       | 42021       | 42121       | 42088       | 42026       | 42307       | 42495       | 42842       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 43093       | 42708       | 42552       | 42597       | 42825       | 42994       | 42322       | 42384       |
| 26 Annual System Demand                                                            | 37314       | 37402       | 37955       | 37970       | 37924       | 37853       | 37867       | 38020       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 29520       | 33597       | 35165       | 34810       | 32146       | 27289       | 28061       | 29902       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 37530       | 37729       | 38163       | 38252       | 38296       | 38090       | 37410       | 37561       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 5628        | 5659        | 5724        | 5738        | 5744        | 5714        | 5612        | 5634        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 34836       | 38911       | 40574       | 40223       | 37539       | 32682       | 33431       | 35296       |
| 31 Surplus or Deficit (-) Capacity (25-30)                                         | 6257        | 3795        | 1978        | 2373        | 5285        | 10312       | 8860        | 7088        |

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**FORECASTED MONTHLY SURPLUS & DEFICIT SUMMARY**  
MEGAWATTS

|                    | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 13          | 8           | 4           | 5           | 5           | 13          | 13          | 13          | 13          | 13          | 14          | 15          |
| AMES               | 34          | 21          | 10          | 22          | 34          | 45          | 55          | 51          | 57          | 55          | 56          | 44          |
| ATL                | 14          | 11          | 10          | 13          | 12          | 15          | 18          | 18          | 17          | 17          | 17          | 17          |
| BEPC               | 586         | 416         | 163         | 290         | 471         | 411         | 415         | 385         | 421         | 452         | 427         | 512         |
| CMMPA              | 16          | 1           | 1           | 3           | 13          | 27          | 1           | 0           | 7           | 9           | 8           | 7           |
| GRE                | 666         | 319         | 120         | 176         | 447         | 914         | 514         | 401         | 402         | 459         | 544         | 555         |
| GSE                | 255         | 125         | 51          | 74          | 164         | 192         | 168         | 127         | 115         | 179         | 185         | 262         |
| HCPD               | 29          | 20          | 11          | 13          | 23          | 27          | 20          | 13          | 11          | 17          | 20          | 22          |
| HMU                | 7           | 4           | 4           | 5           | 5           | 8           | 5           | 5           | 5           | 5           | 5           | 5           |
| HSTG               | 23          | 14          | 7           | 10          | 16          | 34          | 38          | 36          | 40          | 38          | 36          | 33          |
| HUC                | 24          | 15          | 9           | 10          | 17          | 33          | 55          | 54          | 54          | 56          | 56          | 51          |
| LES                | 117         | 102         | 142         | 155         | 149         | 153         | 193         | 188         | 260         | 251         | 259         | 248         |
| MDU                | 111         | 56          | 12          | 25          | 109         | 172         | 108         | 88          | 86          | 102         | 125         | 136         |
| MEAN               | 56          | 43          | 30          | 28          | 44          | 73          | 67          | 60          | 62          | 64          | 67          | 70          |
| MEC                | 1229        | 613         | 231         | 347         | 751         | 2037        | 1742        | 1566        | 1622        | 1710        | 1849        | 1896        |
| MMPA               | 17          | -4          | -16         | -21         | 23          | 55          | 50          | 51          | 53          | 51          | 57          | 53          |
| MP                 | 277         | 223         | 186         | 185         | 243         | 229         | 178         | 138         | 134         | 138         | 220         | 278         |
| MPC                | 20          | 28          | 27          | 27          | 41          | 24          | 54          | 70          | 70          | 71          | 70          | 61          |
| MMU                | 4           | 4           | 4           | 4           | 4           | 7           | 6           | 8           | 20          | 19          | 19          | 19          |
| MPW                | 71          | 56          | 47          | 51          | 57          | 76          | 67          | 65          | 63          | 63          | 65          | 66          |
| MRES               | 188         | 107         | 66          | 74          | 163         | 236         | 164         | 110         | 103         | 119         | 168         | 200         |
| NPPD               | 620         | 246         | 246         | 249         | 265         | 772         | 656         | 609         | 613         | 612         | 674         | 831         |
| NULM               | 24          | 18          | 14          | 12          | 27          | 36          | 43          | 43          | 44          | 43          | 44          | 37          |
| NWPS               | 94          | 33          | 8           | -3          | 35          | 128         | 100         | 85          | 61          | 92          | 97          | 110         |
| OPPD               | 217         | 119         | 77          | 50          | 137         | 766         | 588         | 537         | 475         | 565         | 607         | 332         |
| OTP                | 77          | 87          | 51          | 31          | 72          | 152         | 269         | 219         | 192         | 187         | 271         | 264         |
| PELLA              | 28          | 24          | 25          | 20          | 26          | 37          | 41          | 41          | 29          | 29          | 26          | 20          |
| RPU                | 69          | 62          | 50          | 54          | 55          | 67          | 89          | 89          | 89          | 89          | 90          | 91          |
| SMMPA              | 102         | 54          | 13          | 32          | 94          | 176         | 161         | 101         | 146         | 164         | 182         | 183         |
| WAPA               | 948         | 599         | 259         | 325         | 670         | 951         | 598         | 358         | 399         | 628         | 766         | 976         |
| WLMR               | 9           | 1           | 0           | 0           | 2           | 14          | -4          | -4          | 0           | -1          | 1           | 1           |
| WPPI               | 25          | 23          | 16          | 16          | 25          | 25          | 25          | 25          | 25          | 25          | 25          | 25          |
| XCEL               | 1203        | 403         | 116         | 255         | 700         | 1876        | 638         | 505         | 246         | 349         | 957         | 940         |
| MHEB               | 686         | 622         | 555         | 544         | 733         | 563         | 1320        | 826         | 758         | 896         | 1176        | 1681        |
| SPC                | 811         | 584         | 599         | 480         | 623         | 811         | 550         | 377         | 331         | 412         | 634         | 725         |
| <b>MAPP-US</b>     | 7170        | 3849        | 1995        | 2535        | 4900        | 9782        | 7135        | 6034        | 5934        | 6670        | 8008        | 8361        |
| <b>MAPP-Canada</b> | 1496        | 1206        | 1154        | 1024        | 1356        | 1374        | 1870        | 1202        | 1089        | 1308        | 1810        | 2406        |
| <b>MAPP-Total</b>  | 8666        | 5055        | 3149        | 3559        | 6256        | 11157       | 9005        | 7237        | 7024        | 7978        | 9818        | 10767       |

**FORECASTED MONTHLY SURPLUS & DEFICIT SUMMARY**  
MEGAWATTS

|                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 13          | 9           | 4           | 6           | 6           | 14          | 14          | 14          | 14          | 14          | 15          | 16          |
| AMES               | 35          | 21          | 10          | 23          | 34          | 46          | 56          | 52          | 59          | 56          | 58          | 45          |
| ATL                | 14          | 11          | 10          | 12          | 12          | 15          | 18          | 18          | 17          | 17          | 17          | 17          |
| BEPC               | 498         | 302         | 71          | 199         | 388         | 448         | 423         | 368         | 438         | 473         | 449         | 486         |
| CMMPA              | 2           | -13         | -13         | -11         | -1          | 13          | 34          | 34          | 59          | 60          | 60          | 59          |
| GRE                | 482         | 140         | -51         | -23         | 272         | 751         | 417         | 325         | 326         | 384         | 478         | 534         |
| GSE                | 256         | 122         | 46          | 71          | 159         | 190         | 162         | 119         | 105         | 175         | 181         | 258         |
| HCPD               | 31          | 23          | 14          | 14          | 24          | 28          | 19          | 13          | -14         | -8          | -5          | -3          |
| HMU                | 7           | 4           | 4           | 5           | 4           | 8           | 5           | 5           | 5           | 4           | 4           | 5           |
| HSTG               | 26          | 17          | 11          | 14          | 20          | 38          | 41          | 40          | 38          | 36          | 34          | 31          |
| HUC                | 46          | 37          | 32          | 33          | 39          | 55          | 55          | 54          | 54          | 56          | 55          | 50          |
| LES                | 182         | 89          | 90          | 102         | 99          | 198         | 239         | 233         | 246         | 239         | 248         | 235         |
| MDU                | 150         | 56          | 11          | 23          | 108         | 172         | 105         | 65          | 83          | 99          | 122         | 133         |
| MEAN               | 66          | 52          | 40          | 38          | 54          | 84          | 76          | 70          | 67          | 68          | 70          | 74          |
| MEC                | 1508        | 449         | -12         | 104         | 381         | 1804        | 1830        | 1648        | 1320        | 1410        | 1640        | 1662        |
| MMPA               | 12          | -10         | -22         | -27         | 19          | 52          | 46          | 47          | 47          | 45          | 51          | 48          |
| MMU                | 16          | 16          | 15          | 16          | 16          | 18          | 18          | 20          | 20          | 19          | 18          | 19          |
| MP                 | 325         | 274         | 238         | 237         | 293         | 274         | 257         | 218         | 214         | 217         | 300         | 359         |
| MPC                | 37          | 26          | 25          | 25          | 38          | 25          | 54          | 70          | 70          | 71          | 70          | 61          |
| MPW                | 66          | 51          | 42          | 46          | 53          | 71          | 63          | 60          | 59          | 59          | 60          | 61          |
| MRES               | 279         | 196         | 147         | 155         | 246         | 317         | 242         | 188         | 181         | 197         | 247         | 280         |
| NPPD               | 680         | 305         | 273         | 275         | 297         | 721         | 605         | 557         | 1163        | 1162        | 1226        | 1386        |
| NULM               | 22          | 16          | 13          | 11          | 26          | 35          | 42          | 42          | 43          | 42          | 43          | 36          |
| NWPS               | 62          | 33          | 8           | -3          | 3           | 98          | 98          | 83          | 59          | 90          | 94          | 107         |
| OPPD               | 440         | 122         | 94          | 55          | 220         | 679         | 516         | 451         | 432         | 464         | 523         | 343         |
| OTP                | 73          | 83          | 48          | 27          | 66          | 145         | 188         | 137         | 112         | 107         | 192         | 184         |
| PELLA              | 17          | 12          | 13          | 9           | 14          | 26          | 29          | 29          | 29          | 29          | 25          | 18          |
| RPU                | 91          | 75          | 64          | 68          | 69          | 89          | 89          | 89          | 89          | 89          | 90          | 91          |
| SMMPA              | 131         | 53          | 10          | 31          | 80          | 162         | 146         | 84          | 131         | 146         | 192         | 196         |
| WAPA               | 948         | 599         | 259         | 325         | 670         | 951         | 598         | 358         | 399         | 628         | 766         | 976         |
| WLMR               | 9           | -2          | -5          | -3          | 2           | 14          | -1          | -4          | -12         | -12         | -10         | -10         |
| WPPI               | 25          | 22          | 14          | 15          | 25          | 25          | 25          | 24          | 26          | 25          | 25          | 25          |
| XCEL               | 656         | -388        | -576        | -432        | 245         | 1586        | 859         | 728         | 461         | 699         | 1171        | 1162        |
| MHEB               | 911         | 843         | 772         | 754         | 957         | 783         | 1305        | 809         | 761         | 886         | 1160        | 1664        |
| SPC                | 756         | 526         | 541         | 418         | 566         | 638         | 368         | 214         | 178         | 261         | 489         | 642         |
| <b>MAPP-US</b>     | 7204        | 2799        | 926         | 1437        | 3983        | 9154        | 7371        | 6237        | 6336        | 7160        | 8512        | 8941        |
| <b>MAPP-Canada</b> | 1668        | 1369        | 1313        | 1172        | 1523        | 1422        | 1673        | 1023        | 938         | 1147        | 1649        | 2306        |
| <b>MAPP-Total</b>  | 8872        | 4168        | 2239        | 2610        | 5506        | 10575       | 9044        | 7260        | 7274        | 8307        | 10161       | 11247       |

**FORECASTED MONTHLY SURPLUS & DEFICIT SUMMARY**  
MEGAWATTS

|                    | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 17          | 12          | 8           | 9           | 9           | 17          | 18          | 16          |
| AMES               | 13          | 12          | 0           | 14          | 31          | 43          | 53          | 49          |
| ATL                | 13          | 10          | 10          | 12          | 11          | 15          | 18          | 17          |
| BEPC               | 476         | 279         | 49          | 179         | 369         | 430         | 404         | 348         |
| CMMPA              | 49          | 34          | 34          | 36          | 46          | 61          | 57          | 57          |
| GRE                | 329         | -26         | -224        | -195        | 111         | 607         | 284         | 187         |
| GSE                | 251         | 116         | 37          | 63          | 150         | 182         | 154         | 112         |
| HCPD               | 3           | -6          | -15         | -15         | -6          | -1          | -7          | -13         |
| HMU                | 6           | 3           | 4           | 4           | 4           | 8           | 5           | 5           |
| HSTG               | 35          | 25          | 19          | 22          | 28          | 47          | 50          | 49          |
| HUC                | 46          | 37          | 31          | 32          | 38          | 54          | 54          | 53          |
| LES                | 167         | 73          | 67          | 79          | 83          | 179         | 224         | 218         |
| MDU                | 108         | 52          | 6           | 19          | 105         | 169         | 102         | 61          |
| MEAN               | 57          | 42          | 29          | 26          | 42          | 72          | 64          | 57          |
| MEC                | 1008        | 197         | -124        | -5          | 276         | 1587        | 1562        | 1373        |
| MMPA               | 4           | -18         | -31         | -36         | 12          | 46          | -10         | -9          |
| MMU                | 16          | 16          | 15          | 16          | 16          | 18          | 18          | 20          |
| MP                 | 349         | 298         | 261         | 260         | 317         | 298         | 283         | 243         |
| MPC                | 34          | 24          | 23          | 23          | 33          | 18          | 54          | 70          |
| MPW                | 86          | 70          | 62          | 65          | 72          | 91          | 83          | 80          |
| MRES               | 268         | 183         | 133         | 141         | 234         | 307         | 229         | 174         |
| NPPD               | 1230        | 863         | 825         | 828         | 855         | 1271        | 1154        | 1104        |
| NULM               | 21          | 14          | 11          | 9           | 25          | 34          | 41          | 41          |
| NWPS               | 59          | 34          | 8           | -4          | 0           | 96          | 95          | 80          |
| OPPD               | 384         | 122         | 78          | 50          | 115         | 558         | 476         | 456         |
| OTP                | 86          | 94          | 57          | 39          | 81          | 157         | 127         | 72          |
| PELLA              | 14          | 11          | 12          | 6           | 13          | 25          | 29          | 29          |
| RPU                | 91          | 68          | 59          | 62          | 64          | 89          | 139         | 139         |
| SMPA               | 121         | 57          | 13          | 35          | 80          | 154         | 137         | 74          |
| WAPA               | 948         | 599         | 259         | 325         | 670         | 951         | 598         | 358         |
| WLMR               | -3          | -14         | -17         | -16         | -10         | 3           | -12         | -15         |
| WPPI               | 25          | 20          | 13          | 13          | 25          | 25          | 25          | 23          |
| XCEL               | 142         | -1003       | -1166       | -1015       | -270        | 1140        | 795         | 635         |
|                    |             |             |             |             |             |             |             |             |
| MHEB               | 1131        | 1058        | 979         | 962         | 1176        | 1009        | 1312        | 808         |
| SPC                | 674         | 440         | 456         | 329         | 482         | 553         | 275         | 116         |
|                    |             |             |             |             |             |             |             |             |
| <b>MAPP-US</b>     | 6452        | 2297        | 543         | 1082        | 3628        | 8750        | 7304        | 6163        |
| <b>MAPP-Canada</b> | 1805        | 1498        | 1435        | 1292        | 1658        | 1587        | 1587        | 925         |
| <b>MAPP-Total</b>  | 8257        | 3795        | 1978        | 2373        | 5286        | 10312       | 8890        | 7088        |

# **SEASONAL LOAD AND CAPABILITY DATA**

Section III

## SEASONAL LOAD AND CAPABILITY

Summer 2003 through Summer 2012

|                                                                                                                                                                                                                                     |             |
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**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

MAPP-US

|                                                                                   | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|-----------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                     | 29957       | 24148       | 30555       | 24541       | 31156       | 24947       | 31763       | 25367       | 32413       | 25779       |
| 2 Standby Demand                                                                  | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                           | 29957       | 24148       | 30555       | 24541       | 31156       | 24947       | 31763       | 25367       | 32413       | 25779       |
| 4 Direct Control Load Management                                                  | 74          | 346         | 75          | 357         | 76          | 348         | 78          | 336         | 79          | 329         |
| 5 Interruptible Demand                                                            | 1259        | 220         | 1273        | 220         | 1311        | 220         | 1336        | 220         | 1368        | 220         |
| 6 Net Internal Demand (3-4-5)                                                     | 28624       | 23582       | 29207       | 23964       | 29769       | 24379       | 30347       | 24809       | 30966       | 25230       |
| 7 Schedule L Purchases                                                            | 220         | 475         | 220         | 485         | 220         | 475         | 220         | 465         | 220         | 455         |
| 8 Committed Resources (9+10+11+12)                                                | 32194       | 32646       | 32267       | 32636       | 32275       | 32642       | 32269       | 32643       | 32319       | 32693       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                             | 3566        | 3309        | 3576        | 3311        | 3584        | 3311        | 3584        | 3312        | 3584        | 3312        |
| 10 Other Capacity (1 MW or greater)                                               | 28434       | 29264       | 28497       | 29252       | 28477       | 29262       | 28475       | 29261       | 28525       | 29311       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                             | 10          | 8           | 10          | 8           | 10          | 8           | 10          | 8           | 10          | 8           |
| 12 Other Capacity (less than 1 MW)                                                | 184         | 64          | 184         | 64          | 204         | 61          | 201         | 61          | 201         | 61          |
| 13 Uncommitted Resources                                                          | 500         | 608         | 640         | 971         | 1067        | 1182        | 1079        | 1224        | 2208        | 2375        |
| 14 Total Capacity (8+13)                                                          | 32694       | 33254       | 32907       | 33607       | 33341       | 33824       | 33348       | 33867       | 34527       | 35068       |
| 15 Inoperable Capacity                                                            | 0           | 7           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 16 Net Operable Capacity (14-15)                                                  | 32694       | 33247       | 32907       | 33607       | 33341       | 33824       | 33348       | 33867       | 34527       | 35068       |
| 17 Total Capacity Purchases                                                       | 6132        | 3935        | 5043        | 3310        | 3609        | 3127        | 3777        | 3034        | 3745        | 2990        |
| 18 Full Responsibility, Purchases (Firm)                                          | 1731        | 2366        | 1654        | 2223        | 1616        | 2166        | 1623        | 2192        | 1569        | 2145        |
| 19 Participation Purchases                                                        | 4401        | 1568        | 3389        | 1086        | 2351        | 941         | 2154        | 842         | 2176        | 845         |
| 20 Total Capacity Sales                                                           | 3946        | 3521        | 3491        | 2755        | 2515        | 2671        | 2381        | 2531        | 2223        | 2504        |
| 21 Full Responsibility Sales                                                      | 1513        | 1345        | 1416        | 1330        | 1319        | 1312        | 1329        | 1261        | 1274        | 1195        |
| 22 Participation Sales                                                            | 2433        | 2176        | 2073        | 1425        | 1196        | 1359        | 1052        | 1270        | 949         | 1310        |
| 23 Adjuster: for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                       | 34886       | 33667       | 34495       | 34168       | 34802       | 34286       | 34750       | 34377       | 36055       | 35580       |
| 25 Adjusted Net Capability (14+19+23-22)                                          | 34666       | 32653       | 34229       | 33274       | 34503       | 33412       | 34456       | 33446       | 35760       | 34610       |
| 26 Annual System Demand                                                           | 29933       | 29693       | 30514       | 30238       | 31097       | 30791       | 31066       | 31399       | 32336       | 32046       |
| 27 Monthly Adjusted Net Demand (6-7-16+21)                                        | 26406       | 22561       | 26971       | 23070       | 29471       | 23505       | 30053       | 23678       | 30670       | 24280       |
| 28 Annual Adjusted Net Demand (26-16+21)                                          | 29715       | 28672       | 30278       | 29344       | 30796       | 29917       | 31374       | 30466       | 32041       | 31096       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                     | 4356        | 4208        | 4442        | 4309        | 4520        | 4395        | 4607        | 4478        | 4707        | 4572        |
| 30 Total Firm Capacity Obligation (27+29)                                         | 32764       | 26785       | 33414       | 27396       | 33991       | 27921       | 34659       | 26378       | 35377       | 28676       |
| 31 Surplus or Deficit(-) Capacity (25-30)                                         | 1904        | 5867        | 616         | 5878        | 512         | 5490        | -204        | 5068        | 382         | 5734        |

SUMMER: MAY 1 - OCT 31; WINTER: NOV 1 - APR 30



**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

MAPP-US

|                                                                                    | SUM<br>2006 | WIN<br>2006 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 33022       | 26167       | 33640       | 26561       | 34228       | 26946       | 34811       | 27323       | 35383       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 33022       | 26167       | 33640       | 26561       | 34228       | 26946       | 34811       | 27323       | 35383       |
| 4 Direct Control Load Management                                                   | 60          | 320         | 81          | 331         | 82          | 342         | 84          | 353         | 85          |
| 5 Interruptible Demand                                                             | 1386        | 220         | 1407        | 220         | 1426        | 220         | 1445        | 220         | 1462        |
| 6 Net Internal Demand (3-4-5)                                                      | 31554       | 25627       | 32151       | 26010       | 32720       | 26384       | 33262       | 26750       | 33635       |
| 7 Schedule L Purchases                                                             | 220         | 445         | 220         | 455         | 220         | 465         | 220         | 475         | 220         |
| 8 Committed Resources (9+10+11+12)                                                 | 32320       | 32693       | 32920       | 33293       | 32920       | 33274       | 32901       | 33274       | 32893       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3585        | 3312        | 3585        | 3312        | 3585        | 3293        | 3566        | 3293        | 3566        |
| 10 Other Capacity (1 MW or greater)                                                | 28525       | 29311       | 29125       | 29911       | 29125       | 29912       | 29125       | 29911       | 29117       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 10          | 8           | 10          | 8           | 10          | 8           | 10          | 8           | 10          |
| 12 Other Capacity (less than 1 MW)                                                 | 201         | 61          | 201         | 61          | 201         | 61          | 201         | 61          | 200         |
| 13 Uncommitted Resources                                                           | 2206        | 2375        | 2506        | 2675        | 2506        | 2675        | 2506        | 2675        | 2506        |
| 14 Total Capacity (8+13)                                                           | 34528       | 35068       | 35428       | 35968       | 35428       | 35949       | 35409       | 35949       | 35401       |
| 15 Inoperable Capacity                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 34528       | 35068       | 35428       | 35968       | 35428       | 35949       | 35409       | 35949       | 35401       |
| 17 Total Capacity Purchases                                                        | 3726        | 2996        | 3726        | 3105        | 3662        | 3007        | 3629        | 3022        | 3654        |
| 18 Full Responsibility Purchases (Firm)                                            | 1526        | 2152        | 1526        | 2160        | 1530        | 2167        | 1516        | 2181        | 1520        |
| 19 Participation Purchases                                                         | 2200        | 845         | 2196        | 945         | 2152        | 840         | 2111        | 840         | 2134        |
| 20 Total Capacity Sales                                                            | 1993        | 2405        | 2373        | 2709        | 2333        | 2592        | 2063        | 2388        | 2063        |
| 21 Full Responsibility Sales                                                       | 1154        | 1155        | 1154        | 1159        | 1154        | 1165        | 1079        | 1091        | 1079        |
| 22 Participation Sales                                                             | 839         | 1250        | 1219        | 1550        | 1179        | 1427        | 984         | 1297        | 984         |
| 23 Adjustment for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 36267       | 35667       | 36767       | 36371       | 36763       | 36371       | 36962       | 36569       | 36999       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 35895       | 34670       | 36413       | 35370       | 36407       | 35369       | 36542       | 35496       | 36557       |
| 26 Annual System Demand                                                            | 32952       | 32658       | 33579       | 33248       | 34160       | 33817       | 34741       | 34379       | 35308       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 31181       | 24630       | 31777       | 25009       | 32343       | 25363       | 32842       | 25860       | 33394       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 32579       | 31661       | 33204       | 32245       | 33764       | 32815       | 34301       | 33289       | 34867       |
| 29 Net Reserve Capacity Obligation (26 x 15%)                                      | 4786        | 4657        | 4881        | 4744        | 4968        | 4830        | 5046        | 4901        | 5131        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 35969       | 29310       | 36658       | 29778       | 37312       | 30238       | 37888       | 30582       | 38524       |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | -74         | 5360        | -245        | 5592        | -905        | 5131        | -1346       | 4917        | -1967       |

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**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

MAPP-Canada

|                                                                                    | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 5519        | 6729        | 5615        | 6812        | 5707        | 6925        | 5785        | 6995        | 5845        | 7080        |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 5519        | 6729        | 5615        | 6812        | 5707        | 6925        | 5785        | 6995        | 5845        | 7080        |
| 4 Direct Control Load Management                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 5 Interruptable Demand                                                             | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         | 268         |
| 6 Net Internal Demand (3-4-5)                                                      | 5251        | 6461        | 5347        | 6544        | 5439        | 6657        | 5517        | 6727        | 5577        | 6812        |
| 7 Schedule L Purchases                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 8 Committed Resources (9+10+11+12)                                                 | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 10 Other Capacity (1 MW or greater)                                                | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 13 Uncommitted Resources                                                           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 14 Total Capacity (8+13)                                                           | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        | 6671        | 8565        |
| 15 Inoperable Capacity                                                             | 241         | 0           | 78          | 0           | 228         | 0           | 163         | 0           | 92          | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 6430        | 8565        | 6793        | 8565        | 6443        | 8565        | 6508        | 8565        | 6779        | 8565        |
| 17 Total Capacity Purchases                                                        | 0           | 550         | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         |
| 18 Full Responsibility Purchases (Firm)                                            | 0           | 550         | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         |
| 19 Participation Purchases                                                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 20 Total Capacity Sales                                                            | 1700        | 810         | 1510        | 810         | 1280        | 789         | 1280        | 789         | 1139        | 639         |
| 21 Full Responsibility Sales                                                       | 750         | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         | 0           |
| 22 Participation Sales                                                             | 1010        | 810         | 1010        | 810         | 780         | 789         | 789         | 789         | 639         | 639         |
| 23 Adjustment for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 6870        | 8305        | 7283        | 8255        | 7354        | 8276        | 7419        | 8276        | 7840        | 8426        |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 7861        | 7755        | 7861        | 7755        | 8062        | 7776        | 8062        | 7776        | 8232        | 7926        |
| 26 Annual System Demand                                                            | 6733        | 6736        | 6831        | 6829        | 6916        | 6932        | 6978        | 7005        | 7048        | 7059        |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 6001        | 5911        | 5847        | 6044        | 5939        | 6157        | 6017        | 6227        | 6077        | 6312        |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 7483        | 6186        | 7331        | 6329        | 7416        | 6432        | 7478        | 6505        | 7548        | 6559        |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 897         | 763         | 884         | 784         | 897         | 799         | 906         | 809         | 915         | 816         |
| 30 Total Firm Capacity Obligation (27+29)                                          | 6896        | 6674        | 6732        | 6829        | 6836        | 6956        | 6923        | 7036        | 6992        | 7126        |
| 31 Surplus or Deficit (-) Capacity (25-30)                                         | 962         | 1081        | 1130        | 926         | 1246        | 820         | 1159        | 740         | 1240        | 798         |

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**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

**MAPP Canada**

|                                                                                    | SUM<br>2008 | WIN<br>2008 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 5947        | 7158        | 6029        | 7229        | 6109        | 7290        | 6185        | 7341        | 6229        |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 5947        | 7158        | 6029        | 7229        | 6109        | 7290        | 6185        | 7341        | 6229        |
| 4 Direct Control Load Management                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 5 Interruptable Demand                                                             | 266         | 266         | 266         | 266         | 266         | 266         | 266         | 266         | 266         |
| 6 Net Internal Demand (3-4-5)                                                      | 5679        | 6890        | 5761        | 6961        | 5841        | 7022        | 5917        | 7073        | 5961        |
| 7 Schedule L Purchases                                                             | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 8 Committed Resources (9+10+11+12)                                                 | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 10 Other Capacity (1 MW or greater)                                                | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 12 Other Capacity (less than 1 MW)                                                 | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 13 Uncommitted Resources                                                           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 14 Total Capacity (8+13)                                                           | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        | 8565        | 8671        |
| 15 Inoperable Capacity                                                             | 231         | 0           | 156         | 0           | 156         | 0           | 231         | 0           | 156         |
| 16 Net Operable Capacity (14-15)                                                   | 8640        | 8565        | 8715        | 8565        | 8715        | 8565        | 8640        | 8565        | 8715        |
| 17 Total Capacity Purchases                                                        | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         | 0           |
| 18 Full Responsibility Purchases (Firm)                                            | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         | 0           |
| 19 Participation Purchases                                                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 20 Total Capacity Sales                                                            | 1139        | 639         | 1109        | 609         | 1059        | 559         | 1059        | 559         | 1029        |
| 21 Full Responsibility Sales                                                       | 500         | 0           | 500         | 0           | 500         | 0           | 500         | 0           | 500         |
| 22 Participation Sales                                                             | 639         | 639         | 609         | 609         | 559         | 559         | 559         | 559         | 529         |
| 23 Adjustment for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 7501        | 8426        | 7606        | 8456        | 7656        | 8508        | 7581        | 8508        | 7886        |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 8232        | 7926        | 8262        | 7956        | 8312        | 8006        | 8312        | 8006        | 8342        |
| 26 Annual System Demand                                                            | 7133        | 7158        | 7211        | 7234        | 7282        | 7309        | 7343        | 7379        | 7394        |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 6179        | 6390        | 6261        | 6461        | 6341        | 6522        | 6417        | 6573        | 6461        |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 7633        | 6658        | 7711        | 6734        | 7782        | 6609        | 7843        | 6679        | 7694        |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 927         | 830         | 936         | 840         | 947         | 850         | 955         | 855         | 961         |
| 30 Total Firm Capacity Obligation (27+29)                                          | 7107        | 7220        | 7199        | 7301        | 7286        | 7372        | 7372        | 7431        | 7422        |
| 31 Surplus or Deficit(-) Capacity (25-30)                                          | 1125        | 706         | 1063        | 855         | 1024        | 634         | 940         | 574         | 920         |

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**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

**MAPP-Total**

|                                                                                    | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 35476       | 30877       | 36170       | 31353       | 36863       | 31872       | 37548       | 32362       | 38258       | 32859       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 35476       | 30877       | 36170       | 31353       | 36863       | 31872       | 37548       | 32362       | 38258       | 32859       |
| 4 Direct Control Load Management                                                   | 74          | 346         | 75          | 357         | 76          | 348         | 78          | 338         | 79          | 329         |
| 5 Interruptable Demand                                                             | 1527        | 498         | 1541        | 486         | 1579        | 488         | 1606        | 488         | 1636        | 486         |
| 6 Net Internal Demand (3-4-5)                                                      | 33876       | 30043       | 34554       | 30508       | 35208       | 31036       | 35864       | 31536       | 36542       | 32042       |
| 7 Schedule L Purchases                                                             | 220         | 475         | 220         | 485         | 220         | 475         | 220         | 465         | 220         | 455         |
| 8 Committed Resources (9+10+11+12)                                                 | 41085       | 41211       | 41138       | 41200       | 41148       | 41206       | 41140       | 41208       | 41190       | 41258       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3586        | 3309        | 3578        | 3311        | 3584        | 3311        | 3584        | 3312        | 3584        | 3312        |
| 10 Other Capacity (1 MW or greater)                                                | 37305       | 37829       | 37368       | 37817       | 37348       | 37826       | 37346       | 37826       | 37395       | 37876       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 10          | 9           | 10          | 9           | 10          | 8           | 10          | 8           | 10          | 8           |
| 12 Other Capacity (less than 1 MW)                                                 | 184         | 64          | 184         | 64          | 204         | 61          | 201         | 61          | 201         | 61          |
| 13 Uncommitted Resources                                                           | 500         | 608         | 640         | 971         | 1087        | 1182        | 1079        | 1224        | 2208        | 2375        |
| 14 Total Capacity (8+13)                                                           | 41586       | 41819       | 41778       | 42172       | 42212       | 42369       | 42218       | 42432       | 43397       | 43633       |
| 15 Inoperable Capacity                                                             | 241         | 7           | 78          | 0           | 228         | 0           | 163         | 0           | 92          | 0           |
| 16 Net Operable Capacity (14-15)                                                   | 41325       | 41812       | 41700       | 42172       | 41984       | 42369       | 42055       | 42432       | 43305       | 43633       |
| 17 Total Capacity Purchases                                                        | 6132        | 4485        | 5043        | 3810        | 3969        | 3627        | 3777        | 3534        | 3745        | 3490        |
| 18 Full Responsibility Purchases (Firm)                                            | 1731        | 2916        | 1654        | 2723        | 1618        | 2686        | 1623        | 2672        | 1569        | 2845        |
| 19 Participation Purchases                                                         | 4401        | 1568        | 3389        | 1086        | 2351        | 941         | 2154        | 842         | 2176        | 845         |
| 20 Total Capacity Sales                                                            | 5706        | 4331        | 5001        | 3585        | 3604        | 3460        | 3670        | 3320        | 3362        | 3143        |
| 21 Full Responsibility Sales                                                       | 2263        | 1345        | 1918        | 1330        | 1819        | 1312        | 1829        | 1261        | 1774        | 1195        |
| 22 Participation Sales                                                             | 3443        | 2986        | 3083        | 2255        | 1985        | 2148        | 1841        | 2059        | 1588        | 1949        |
| 23 Adjustment for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 41677       | 41972       | 41748       | 42423       | 42156       | 42561       | 42188       | 42653       | 43695       | 43986       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 42440       | 40408       | 42091       | 41029       | 42585       | 41187       | 42537       | 41222       | 43991       | 42536       |
| 26 Annual System Demand                                                            | 36666       | 36429       | 37345       | 37087       | 36013       | 37723       | 36646       | 36405       | 39384       | 39105       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 34408       | 28472       | 34819       | 29114       | 35409       | 29062       | 36070       | 30108       | 36747       | 30592       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 37196       | 34859       | 37609       | 35673       | 36214       | 36349       | 38852       | 36974       | 39589       | 37655       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 5579        | 5229        | 5641        | 5351        | 5432        | 5452        | 5828        | 5546        | 5938        | 5643        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 39987       | 34081       | 40460       | 41024       | 41646       | 41781       | 44678       | 42524       | 45527       | 43238       |
| 31 Surplus or Deficit (-) Capacity (25-30)                                         | 2787        | 6948        | 1945        | 6804        | 1758        | 6310        | 955         | 5808        | 1623        | 6532        |

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**FORECASTED SEASONAL LOAD & CAPABILITY**  
MEGAWATTS

**MAPP-Total**

|                                                                                    | SUM<br>2008 | WIN<br>2008 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 Internal Demand in MW (3-2)                                                      | 38989       | 33325       | 38989       | 33790       | 40337       | 34236       | 40996       | 34864       | 41612       |
| 2 Standby Demand                                                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| 3 Total Internal Demand                                                            | 38989       | 33325       | 38989       | 33790       | 40337       | 34236       | 40996       | 34864       | 41612       |
| 4 Direct Control Load Management                                                   | 80          | 320         | 81          | 331         | 82          | 342         | 84          | 353         | 85          |
| 5 Interruptible Demand                                                             | 1656        | 486         | 1675        | 488         | 1694        | 488         | 1713        | 488         | 1730        |
| 6 Net Internal Demand (3-4-5)                                                      | 37233       | 32517       | 37912       | 32971       | 38561       | 33406       | 39198       | 33823       | 38796       |
| 7 Schedule L Purchases                                                             | 220         | 445         | 220         | 455         | 220         | 485         | 220         | 475         | 220         |
| 8 Committed Resources (9+10+11+12)                                                 | 41191       | 41258       | 41791       | 41858       | 41791       | 41839       | 41772       | 41839       | 41764       |
| 9 Distributed Generator Capacity<br>(1 MW or greater)                              | 3585        | 3312        | 3585        | 3312        | 3585        | 3293        | 3585        | 3293        | 3585        |
| 10 Other Capacity (1 MW or greater)                                                | 37395       | 37876       | 37995       | 38476       | 37995       | 38476       | 37995       | 38476       | 37988       |
| 11 Distributed Generator Capacity<br>(less than 1 MW)                              | 10          | 8           | 10          | 8           | 10          | 8           | 10          | 8           | 10          |
| 12 Other Capacity (less than 1 MW)                                                 | 201         | 61          | 201         | 61          | 201         | 61          | 201         | 61          | 200         |
| 13 Uncommitted Resources                                                           | 2208        | 2375        | 2508        | 2675        | 2508        | 2675        | 2508        | 2675        | 2508        |
| 14 Total Capacity (8+13)                                                           | 43399       | 43633       | 44299       | 44533       | 44299       | 44514       | 44280       | 44514       | 44272       |
| 15 Inoperable Capacity                                                             | 231         | 0           | 156         | 0           | 156         | 0           | 231         | 0           | 156         |
| 16 Net Operable Capacity (14-15)                                                   | 43168       | 43633       | 44143       | 44533       | 44143       | 44514       | 44049       | 44514       | 44116       |
| 17 Total Capacity Purchases                                                        | 3726        | 3498        | 3726        | 3605        | 3682        | 3507        | 3629        | 3522        | 3654        |
| 18 Full Responsibility Purchases (Firm)                                            | 1528        | 2652        | 1528        | 2660        | 1530        | 2667        | 1518        | 2681        | 1520        |
| 19 Participation Purchases                                                         | 2200        | 845         | 2198        | 945         | 2152        | 840         | 2111        | 840         | 2134        |
| 20 Total Capacity Sales                                                            | 3132        | 3044        | 3482        | 3318        | 3392        | 3151        | 3122        | 2947        | 3082        |
| 21 Full Responsibility Sales                                                       | 1654        | 1155        | 1654        | 1159        | 1654        | 1165        | 1579        | 1091        | 1579        |
| 22 Participation Sales                                                             | 1478        | 1889        | 1828        | 2159        | 1738        | 1986        | 1543        | 1856        | 1513        |
| 23 Adjustment for Remotely Located (totally owned<br>or shared) Generating Unit(s) | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           | 6           |
| 24 Planned Capacity Resources (16+17+23-20)                                        | 43768       | 44093       | 44393       | 44826       | 44439       | 44877       | 44563       | 45095       | 44685       |
| 25 Adjusted Net Capability (14+19+23-22)                                           | 44127       | 42596       | 44675       | 43326       | 44719       | 43375       | 44654       | 43505       | 44899       |
| 26 Annual System Demand                                                            | 40085       | 39616       | 40789       | 40480       | 41442       | 41126       | 42084       | 41758       | 42702       |
| 27 Monthly Adjusted Net Demand (6-7-18+21)                                         | 37381       | 31020       | 38038       | 31470       | 38685       | 31905       | 39259       | 32233       | 39655       |
| 28 Annual Adjusted Net Demand (26-18+21)                                           | 40212       | 36319       | 40915       | 36979       | 41565       | 38624       | 42144       | 40166       | 42781       |
| 29 Net Reserve Capacity Obligation (28 x 15%)                                      | 5715        | 5486        | 5819        | 5584        | 5915        | 5679        | 6001        | 5759        | 6091        |
| 30 Total Firm Capacity Obligation (27+29)                                          | 43076       | 36530       | 43857       | 37078       | 44600       | 37610       | 45260       | 38013       | 45946       |
| 31 Surplus or Deficit (-) Capacity (25-30)                                         | 1051        | 6066        | 618         | 6247        | 119         | 5765        | -406        | 5491        | -1047       |

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**FORECASTED SEASONAL SURPLUS & DEFICIT SUMMARY**  
MEGAWATTS

|                    | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 5           | 12          | 4           | 13          | 8           | 15          | 7           | 15          | 7           | 14          |
| AMES               | 10          | 51          | 10          | 52          | 0           | 48          | -2          | 47          | -4          | 46          |
| ATL                | 10          | 17          | 10          | 17          | 10          | 17          | 9           | 17          | 9           | 17          |
| BEPC               | 166         | 440         | 74          | 460         | 52          | 435         | 43          | 557         | 153         | 550         |
| CMPMPA             | -2          | 7           | -17         | 58          | 43          | 56          | 33          | 72          | 47          | 70          |
| GRE                | 120         | 401         | -51         | 325         | -224        | 187         | -364        | 101         | -140        | 488         |
| GSE                | 56          | 115         | 46          | 105         | 37          | 89          | 18          | 67          | -12         | 47          |
| HCPD               | 11          | 11          | 14          | -14         | -15         | -15         | -37         | -36         | -47         | -46         |
| HMU                | 4           | 5           | 4           | 5           | 4           | 5           | 3           | 4           | 3           | 4           |
| HSTG               | 7           | 31          | 11          | 34          | 19          | 43          | 15          | 41          | 36          | 63          |
| HUC                | 9           | 54          | 32          | 54          | 31          | 53          | 31          | 53          | 30          | 52          |
| LES                | 142         | 251         | 90          | 243         | 67          | 227         | 47          | 217         | 76          | 253         |
| MDU                | 12          | 68          | 11          | 65          | 6           | 61          | 2           | 34          | 9           | 30          |
| MEAN               | 30          | 66          | 40          | 71          | 29          | 66          | 28          | 65          | 8           | 45          |
| MEC                | 231         | 1671        | -13         | 1377        | -120        | 1480        | -237        | 1397        | 254         | 1869        |
| MPMPA              | -21         | 59          | -27         | 56          | -36         | -4          | -103        | -19         | -113        | -26         |
| MMU                | 6           | 9           | 18          | 20          | 18          | 20          | 18          | 20          | 18          | 20          |
| MP                 | 186         | 134         | 238         | 214         | 261         | 215         | 220         | 174         | 179         | 220         |
| MPC                | 27          | 70          | 25          | 70          | 23          | 71          | 41          | 72          | 59          | 72          |
| MPW                | 47          | 63          | 42          | 59          | 62          | 78          | 58          | 76          | 56          | 74          |
| MRES               | 66          | 105         | 147         | 183         | 133         | 170         | 116         | 157         | 103         | 145         |
| NPPD               | 166         | 613         | 273         | 1163        | 825         | 1116        | 780         | 1077        | 749         | 1053        |
| NULM               | 12          | 37          | 11          | 36          | 9           | 35          | 7           | 34          | 6           | 33          |
| NWPS               | -3          | 61          | -3          | 59          | -4          | 56          | -3          | 54          | 0           | 51          |
| OPPD               | 50          | 475         | 55          | 432         | 51          | 383         | 52          | 307         | 52          | 246         |
| OTP                | 31          | 187         | 27          | 107         | 39          | 47          | 41          | 44          | 35          | 37          |
| PELLA              | 20          | 25          | 9           | 24          | 6           | 24          | 6           | 34          | 17          | 34          |
| RPU                | 50          | 89          | 64          | 89          | 59          | 139         | 101         | 139         | 93          | 139         |
| SMMPA              | 13          | 66          | 10          | 50          | 13          | 15          | 14          | 4           | 6           | -4          |
| WAPA               | 230         | 251         | 230         | 251         | 230         | 251         | 230         | 251         | 230         | 251         |
| WLMR               | 0           | -3          | -5          | -14         | -17         | -13         | -17         | -15         | -19         | -16         |
| WPPI               | 16          | 25          | 14          | 24          | 13          | 23          | 12          | 21          | 16          | 26          |
| XCEL               | 116         | 400         | -576        | 192         | -1116       | 97          | -1375       | -11         | -1536       | -123        |
|                    |             |             |             |             |             |             |             |             |             |             |
| MHEB               | 502         | 737         | 712         | 739         | 920         | 742         | 882         | 713         | 1008        | 851         |
| SPC                | 460         | 345         | 418         | 187         | 326         | 77          | 277         | 27          | 232         | -53         |
|                    |             |             |             |             |             |             |             |             |             |             |
| <b>MAPP-US</b>     | 1824        | 5867        | 816         | 5878        | 512         | 5490        | -204        | 5068        | 382         | 5734        |
| <b>MAPP-Canada</b> | 962         | 1081        | 1130        | 926         | 1246        | 820         | 1159        | 740         | 1240        | 798         |
| <b>MAPP-Total</b>  | 2787        | 6948        | 1945        | 6804        | 1758        | 6310        | 955         | 5808        | 1623        | 6532        |

**FORECASTED SEASONAL SURPLUS & DEFICIT SUMMARY**  
MEGAWATTS

|                    | SUM<br>2008 | WIN<br>2008 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 6           | 14          | 6           | 14          | 5           | 13          | 5           | 13          | 4           |
| AMES               | -6          | 44          | -9          | 43          | -11         | 43          | -11         | 43          | -11         |
| ATL                | 9           | 17          | 8           | 17          | 8           | 16          | 8           | 16          | 7           |
| BEPC               | 136         | 531         | 111         | 514         | 95          | 591         | 71          | 574         | 52          |
| CMPMA              | 46          | 69          | 44          | 68          | 43          | 66          | 40          | 64          | 38          |
| GRE                | -154        | 524         | -224        | 401         | -351        | 334         | -355        | 382         | -478        |
| GSE                | -80         | -16         | 201         | 270         | 182         | 257         | 163         | 243         | 143         |
| HCPD               | -47         | -47         | -48         | -47         | -48         | -48         | -49         | -48         | -49         |
| HMU                | 3           | 4           | 2           | 4           | 2           | 4           | 2           | 4           | 2           |
| HSTG               | 33          | 61          | 30          | 58          | 27          | 56          | 23          | 53          | 20          |
| HUC                | 30          | 52          | 28          | 50          | 28          | 50          | 27          | 50          | 27          |
| LES                | 57          | 291         | 90          | 283         | 71          | 270         | 50          | 256         | 33          |
| MDU                | 5           | 27          | 1           | 23          | -4          | 20          | -8          | 16          | -12         |
| MEAN               | 5           | 43          | 4           | 43          | 2           | 40          | 0           | 39          | -3          |
| MEC                | 128         | 1730        | -37         | 1642        | -151        | 1555        | -259        | 1474        | -362        |
| MMPA               | -123        | -33         | -163        | -70         | -174        | -102        | -210        | -110        | -252        |
| MMU                | 18          | 20          | 18          | 20          | 18          | 20          | 18          | 20          | 18          |
| MP                 | 226         | 181         | 173         | 153         | 156         | 137         | 132         | 116         | 115         |
| MPC                | 78          | 73          | 96          | 73          | 94          | 73          | 92          | 73          | 90          |
| MPW                | 54          | 72          | 52          | 70          | 48          | 49          | 27          | 47          | 25          |
| MRES               | 90          | 133         | 77          | 122         | 63          | 108         | 46          | 95          | 33          |
| NPPD               | 762         | 1074        | 895         | 1213        | 848         | 1171        | 894         | 1229        | 838         |
| NULM               | 4           | 32          | 3           | 31          | 1           | 30          | -1          | 29          | -3          |
| NWPS               | 0           | 49          | 0           | 46          | 0           | 44          | 0           | 41          | 0           |
| OPPD               | 54          | 201         | 52          | 468         | 52          | 439         | 54          | 413         | 53          |
| OTP                | 28          | 34          | 22          | 28          | -36         | -24         | -37         | -24         | -37         |
| PELLA              | 17          | 33          | 16          | 32          | 16          | 31          | 14          | 41          | 14          |
| RPU                | 85          | 139         | 75          | 139         | 66          | 164         | 83          | 164         | 74          |
| SMMPA              | -55         | -12         | -64         | -19         | -73         | -27         | -83         | -35         | -93         |
| WAPA               | 230         | 251         | 230         | 251         | 230         | 251         | 230         | 251         | 230         |
| WLMR               | -22         | -17         | -24         | -18         | -25         | -50         | -63         | -51         | -66         |
| WPPI               | 15          | 24          | 13          | 23          | 12          | 22          | 11          | 20          | 9           |
| XCEL               | -1706       | -238        | -1924       | -353        | -2098       | -472        | -2261       | -584        | -2427       |
| MHEB               | 971         | 823         | 965         | 828         | 976         | 848         | 929         | 809         | 924         |
| SPC                | 154         | -117        | 98          | -173        | 48          | -214        | 12          | -234        | -4          |
| <b>MAPP-US</b>     | -74         | 5360        | -245        | 5592        | -905        | 5131        | -1346       | 4917        | -1967       |
| <b>MAPP-Canada</b> | 1125        | 706         | 1063        | 655         | 1024        | 634         | 940         | 574         | 920         |
| <b>MAPP-Total</b>  | 1051        | 6066        | 818         | 6247        | 119         | 5765        | -406        | 5491        | -1047       |

## **GENERATOR CAPABILITY DATA**



## GENERATOR CAPABILITY DATA

|                                                                                                                                                                                                                                  |       |
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**FORECASTED MONTHLY GENERATION CAPABILITY SUMMARY**  
MEGAWATTS

|                    | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          |
| AMES               | 122         | 122         | 121         | 121         | 122         | 123         | 125         | 126         | 126         | 126         | 126         | 123         |
| ATL                | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          |
| BEPC               | 1768        | 1765        | 1761        | 1755        | 1753        | 1751        | 1753        | 1764        | 1767        | 1768        | 1768        | 1768        |
| CMMPA              | 138         | 138         | 138         | 138         | 138         | 138         | 138         | 138         | 141         | 141         | 141         | 141         |
| GRE                | 2403        | 2355        | 2340        | 2342        | 2369        | 2434        | 2438        | 2472        | 2474        | 2474        | 2431        | 2380        |
| GSE                | 1120        | 1096        | 1089        | 1092        | 1116        | 1144        | 1157        | 1163        | 1165        | 1162        | 1159        | 1152        |
| HCPD               | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          |
| HMU                | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           |
| HSTG               | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         |
| HUC                | 104         | 102         | 102         | 102         | 104         | 106         | 106         | 106         | 106         | 106         | 106         | 106         |
| LES                | 476         | 551         | 588         | 588         | 588         | 530         | 565         | 573         | 636         | 632         | 625         | 603         |
| MDU                | 439         | 475         | 472         | 472         | 475         | 481         | 442         | 445         | 446         | 446         | 444         | 439         |
| MEAN               | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          |
| MEC                | 4753        | 5045        | 5038        | 5037        | 5054        | 5104        | 5145        | 5192        | 5197        | 5195        | 5144        | 5063        |
| MMPA               | 43          | 43          | 43          | 43          | 43          | 43          | 47          | 49          | 49          | 49          | 48          | 45          |
| MMU                | 16          | 15          | 15          | 15          | 15          | 18          | 18          | 20          | 20          | 20          | 19          | 19          |
| MP                 | 1985        | 1985        | 1982        | 1979        | 1987        | 1985        | 1987        | 1982        | 1980        | 1979        | 1982        | 1985        |
| MPC                | 575         | 565         | 563         | 563         | 575         | 575         | 575         | 575         | 575         | 575         | 575         | 575         |
| MPW                | 234         | 233         | 233         | 233         | 234         | 234         | 226         | 226         | 226         | 226         | 226         | 226         |
| MRES               | 416         | 413         | 418         | 419         | 421         | 436         | 440         | 441         | 441         | 441         | 440         | 439         |
| NPPD               | 3184        | 3179        | 3166        | 3167        | 3178        | 3185        | 3186        | 3188        | 3193        | 3189        | 3186        | 3186        |
| NULM               | 73          | 71          | 71          | 71          | 73          | 75          | 81          | 80          | 80          | 80          | 81          | 75          |
| NWPS               | 327         | 315         | 312         | 312         | 316         | 329         | 332         | 332         | 332         | 332         | 332         | 332         |
| OPPD               | 2262        | 2557        | 2545        | 2545        | 2567        | 2278        | 2177        | 2177        | 2177        | 2177        | 2176        | 2130        |
| OTP                | 690         | 683         | 678         | 678         | 684         | 697         | 707         | 711         | 711         | 711         | 708         | 703         |
| PELLA              | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          |
| RPU                | 191         | 191         | 190         | 190         | 189         | 189         | 189         | 189         | 189         | 189         | 190         | 191         |
| SMMPA              | 581         | 596         | 596         | 596         | 596         | 591         | 591         | 591         | 591         | 591         | 591         | 591         |
| WAPA               | 2408        | 2444        | 2446        | 2430        | 2417        | 2380        | 2307        | 2299        | 2316        | 2326        | 2376        | 2393        |
| WLMR               | 35          | 35          | 35          | 35          | 35          | 35          | 21          | 21          | 21          | 21          | 21          | 21          |
| WPPI               | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         |
| XCEL               | 7359        | 7286        | 7237        | 7257        | 7359        | 7463        | 7668        | 7663        | 7678        | 7659        | 7686        | 7519        |
| MHEB               | 5490        | 5434        | 5416        | 5458        | 5491        | 5517        | 5116        | 5077        | 5033        | 5011        | 5019        | 5062        |
| SPC                | 3554        | 3455        | 3455        | 3455        | 3455        | 3554        | 3554        | 3554        | 3554        | 3554        | 3554        | 3554        |
| <b>MAPP-US</b>     | 32243       | 32799       | 32719       | 32720       | 32949       | 32864       | 32961       | 33064       | 33178       | 33155       | 33122       | 32747       |
| <b>MAPP-Canada</b> | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8565        | 8573        | 8616        |
| <b>MAPP-Total</b>  | 41287       | 41689       | 41590       | 41633       | 41896       | 41934       | 41631       | 41695       | 41765       | 41720       | 41694       | 41363       |

**FORECASTED MONTHLY GENERATION CAPABILITY SUMMARY**  
MEGAWATTS

|                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          |
| AMES               | 122         | 122         | 121         | 121         | 122         | 123         | 125         | 126         | 126         | 126         | 126         | 123         |
| ATL                | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          |
| BEPC               | 1768        | 1765        | 1761        | 1755        | 1753        | 1751        | 1753        | 1764        | 1767        | 1768        | 1768        | 1768        |
| CMMPA              | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         |
| GRE                | 2403        | 2355        | 2340        | 2342        | 2369        | 2434        | 2438        | 2472        | 2474        | 2474        | 2431        | 2380        |
| GSE                | 1129        | 1105        | 1098        | 1101        | 1121        | 1150        | 1163        | 1169        | 1171        | 1168        | 1165        | 1158        |
| HCPD               | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          |
| HMU                | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           |
| HSTG               | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         |
| HUC                | 104         | 102         | 102         | 102         | 104         | 106         | 106         | 106         | 106         | 106         | 106         | 106         |
| LES                | 642         | 641         | 641         | 641         | 641         | 583         | 618         | 626         | 636         | 632         | 625         | 603         |
| MDU                | 478         | 475         | 472         | 472         | 475         | 481         | 442         | 445         | 446         | 446         | 444         | 439         |
| MEAN               | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          |
| MEC                | 5063        | 5085        | 5078        | 5077        | 5094        | 5144        | 5185        | 5232        | 5237        | 5235        | 5374        | 5293        |
| MMPA               | 43          | 43          | 43          | 43          | 43          | 43          | 47          | 49          | 49          | 49          | 48          | 45          |
| MMU                | 16          | 15          | 15          | 15          | 15          | 18          | 18          | 20          | 20          | 20          | 19          | 19          |
| MP                 | 1985        | 1985        | 1982        | 1979        | 1987        | 1985        | 1987        | 1982        | 1980        | 1979        | 1982        | 1985        |
| MPC                | 575         | 565         | 563         | 563         | 575         | 575         | 575         | 575         | 575         | 575         | 575         | 575         |
| MPW                | 234         | 233         | 233         | 233         | 234         | 234         | 226         | 226         | 226         | 226         | 226         | 226         |
| MRES               | 516         | 513         | 512         | 513         | 515         | 526         | 530         | 531         | 531         | 531         | 530         | 529         |
| NPPD               | 3184        | 3179        | 3166        | 3167        | 3178        | 3195        | 3196        | 3198        | 3420        | 3416        | 3413        | 3413        |
| NULM               | 73          | 71          | 71          | 71          | 73          | 75          | 81          | 80          | 80          | 80          | 81          | 75          |
| NWPS               | 327         | 315         | 312         | 312         | 316         | 329         | 332         | 332         | 332         | 332         | 332         | 332         |
| OPPD               | 2586        | 2563        | 2551        | 2551        | 2573        | 2284        | 2177        | 2177        | 2178        | 2178        | 2178        | 2132        |
| OTP                | 690         | 683         | 678         | 678         | 684         | 697         | 707         | 711         | 711         | 711         | 708         | 703         |
| PELLA              | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          |
| RPU                | 191         | 191         | 190         | 190         | 189         | 189         | 189         | 189         | 189         | 189         | 190         | 191         |
| SMMPA              | 591         | 603         | 603         | 603         | 603         | 591         | 591         | 591         | 591         | 591         | 591         | 591         |
| WAPA               | 2408        | 2444        | 2446        | 2430        | 2417        | 2380        | 2307        | 2299        | 2316        | 2326        | 2376        | 2393        |
| WLMR               | 35          | 35          | 35          | 35          | 35          | 35          | 21          | 21          | 9           | 9           | 9           | 9           |
| WPPI               | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         |
| XCEL               | 7359        | 7286        | 7237        | 7257        | 7359        | 7463        | 7668        | 7663        | 7678        | 7659        | 7686        | 7519        |
| MHEB               | 5490        | 5434        | 5416        | 5458        | 5491        | 5517        | 5116        | 5077        | 5033        | 5011        | 5019        | 5062        |
| SPC                | 3554        | 3455        | 3455        | 3455        | 3455        | 3554        | 3554        | 3554        | 3554        | 3554        | 3554        | 3554        |
| <b>MAPP-US</b>     | 33205       | 33055       | 32931       | 32932       | 33156       | 33072       | 33163       | 33266       | 33530       | 33508       | 33664       | 33290       |
| <b>MAPP-Canada</b> | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        | 8587        | 8565        | 8573        | 8616        |
| <b>MAPP-Total</b>  | 42248       | 41944       | 41802       | 41846       | 42103       | 42143       | 41833       | 41897       | 42117       | 42073       | 42237       | 41906       |

**FORECASTED MONTHLY GENERATION CAPABILITY SUMMARY**  
MEGAWATTS

|                    | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          |
| AMES               | 122         | 142         | 141         | 141         | 142         | 143         | 145         | 146         |
| ATL                | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          |
| BEPC               | 1768        | 1765        | 1761        | 1755        | 1753        | 1751        | 1753        | 1764        |
| CMPA               | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         |
| GRE                | 2403        | 2355        | 2340        | 2342        | 2369        | 2434        | 2438        | 2472        |
| GSE                | 1135        | 1115        | 1108        | 1111        | 1127        | 1154        | 1167        | 1173        |
| HCPD               | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          |
| HMU                | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           |
| HSTG               | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         |
| HUC                | 104         | 102         | 102         | 102         | 104         | 106         | 106         | 106         |
| LES                | 642         | 641         | 641         | 641         | 641         | 583         | 618         | 626         |
| MDU                | 439         | 475         | 472         | 472         | 475         | 481         | 442         | 445         |
| MEAN               | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          |
| MEC                | 5293        | 5275        | 5268        | 5267        | 5284        | 5334        | 5375        | 5422        |
| MMPA               | 43          | 43          | 43          | 43          | 43          | 43          | 47          | 49          |
| MMU                | 16          | 15          | 15          | 15          | 15          | 18          | 18          | 20          |
| MP                 | 1985        | 1985        | 1982        | 1979        | 1987        | 1985        | 1987        | 1982        |
| MPC                | 575         | 565         | 563         | 563         | 575         | 575         | 575         | 575         |
| MPW                | 234         | 233         | 233         | 233         | 234         | 234         | 226         | 226         |
| MRES               | 516         | 513         | 512         | 513         | 515         | 526         | 530         | 531         |
| NPPD               | 3411        | 3406        | 3393        | 3394        | 3405        | 3411        | 3412        | 3414        |
| NULM               | 73          | 71          | 71          | 71          | 73          | 75          | 81          | 80          |
| NWPS               | 327         | 315         | 312         | 312         | 316         | 329         | 332         | 332         |
| OPPD               | 2588        | 2565        | 2553        | 2552        | 2575        | 2286        | 2178        | 2178        |
| OTP                | 682         | 675         | 670         | 670         | 676         | 689         | 699         | 703         |
| PELLA              | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          |
| RPU                | 191         | 191         | 190         | 190         | 189         | 189         | 189         | 189         |
| SMPA               | 591         | 609         | 609         | 609         | 609         | 591         | 591         | 591         |
| WAPA               | 2408        | 2444        | 2446        | 2430        | 2417        | 2380        | 2307        | 2299        |
| WLMR               | 23          | 23          | 23          | 23          | 23          | 23          | 9           | 9           |
| WPPI               | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         |
| XCEL               | 7359        | 7286        | 7237        | 7257        | 7359        | 7463        | 7668        | 7663        |
| MHEB               | 5490        | 5434        | 5416        | 5458        | 5491        | 5517        | 5116        | 5077        |
| SPC                | 3554        | 3455        | 3455        | 3455        | 3455        | 3554        | 3554        | 3554        |
| <b>MAPP-US</b>     | 33610       | 33489       | 33366       | 33367       | 33587       | 33484       | 33575       | 33678       |
| <b>MAPP-Canada</b> | 9044        | 8889        | 8871        | 8913        | 8947        | 9071        | 8670        | 8631        |
| <b>MAPP-Total</b>  | 42654       | 42379       | 42237       | 42280       | 42534       | 42554       | 42245       | 42309       |

FORECASTED SEASONAL GENERATION CAPABILITY SUMMARY  
MEGAWATTS

|                    | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          |
| AMES               | 121         | 126         | 121         | 126         | 141         | 146         | 141         | 146         | 141         | 146         |
| ATL                | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          |
| BEPC               | 1764        | 1768        | 1764        | 1768        | 1764        | 1768        | 1764        | 1768        | 1764        | 1768        |
| CMMPA              | 138         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         |
| GRE                | 2340        | 2472        | 2340        | 2472        | 2340        | 2472        | 2340        | 2472        | 2740        | 2972        |
| GSE                | 1089        | 1165        | 1098        | 1171        | 1108        | 1175        | 1108        | 1175        | 1108        | 1175        |
| HCPD               | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          |
| HMU                | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           |
| HSTG               | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 157         | 157         |
| HUC                | 102         | 106         | 102         | 106         | 102         | 106         | 102         | 106         | 102         | 106         |
| LES                | 588         | 636         | 641         | 636         | 641         | 636         | 641         | 636         | 741         | 736         |
| MDU                | 472         | 445         | 472         | 445         | 472         | 445         | 472         | 487         | 550         | 487         |
| MEAN               | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 91          | 141         | 141         |
| MEC                | 5036        | 5297        | 5076        | 5337        | 5266        | 5532        | 5266        | 5532        | 5792        | 6058        |
| MMPA               | 43          | 49          | 43          | 49          | 43          | 49          | 43          | 49          | 43          | 49          |
| MMU                | 18          | 20          | 18          | 20          | 18          | 20          | 18          | 20          | 18          | 20          |
| MP                 | 1982        | 1980        | 1982        | 1980        | 1982        | 1956        | 1959        | 1932        | 1935        | 1909        |
| MPG                | 563         | 575         | 563         | 575         | 563         | 599         | 587         | 622         | 610         | 646         |
| MPW                | 233         | 226         | 233         | 226         | 233         | 226         | 233         | 226         | 233         | 226         |
| MRES               | 418         | 441         | 512         | 531         | 512         | 531         | 512         | 531         | 512         | 531         |
| NPPD               | 3166        | 3193        | 3166        | 3420        | 3393        | 3426        | 3399        | 3426        | 3399        | 3426        |
| NULM               | 71          | 75          | 71          | 75          | 71          | 75          | 71          | 75          | 71          | 75          |
| NWPS               | 312         | 332         | 312         | 332         | 312         | 332         | 312         | 332         | 312         | 332         |
| OPPD               | 2545        | 2177        | 2551        | 2178        | 2553        | 2178        | 2553        | 2180        | 2553        | 2180        |
| OTP                | 678         | 711         | 678         | 711         | 670         | 703         | 670         | 703         | 670         | 703         |
| PELLA              | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          |
| RPU                | 190         | 189         | 190         | 189         | 190         | 189         | 190         | 189         | 190         | 189         |
| SMMPA              | 596         | 591         | 603         | 591         | 609         | 591         | 609         | 591         | 609         | 591         |
| WAPA               | 2417        | 2299        | 2417        | 2299        | 2417        | 2299        | 2417        | 2299        | 2417        | 2299        |
| WLMR               | 35          | 21          | 35          | 9           | 23          | 9           | 23          | 9           | 23          | 9           |
| WPPI               | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         |
| XCEL               | 7237        | 7678        | 7237        | 7678        | 7237        | 7678        | 7237        | 7678        | 7237        | 7678        |
| MHEB               | 5416        | 5011        | 5416        | 5011        | 5416        | 5011        | 5416        | 5011        | 5416        | 5011        |
| SPC                | 3455        | 3554        | 3455        | 3554        | 3455        | 3553        | 3455        | 3553        | 3455        | 3553        |
| <b>MAPP-US</b>     | 32694       | 33254       | 32907       | 33607       | 33341       | 33824       | 33348       | 33867       | 34527       | 35068       |
| <b>MAPP-Canada</b> | 8871        | 8565        | 8871        | 8565        | 8871        | 8565        | 8871        | 8565        | 8871        | 8565        |
| <b>MAPP-Total</b>  | 41566       | 41819       | 41778       | 42172       | 42212       | 42389       | 42218       | 42432       | 43397       | 43633       |

FORECASTED SEASONAL GENERATION CAPABILITY SUMMARY  
MEGAWATTS

|             | SUM<br>2008 | WIN<br>2008 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN        | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          | 37          |
| AMES        | 141         | 146         | 141         | 146         | 141         | 146         | 141         | 146         | 141         |
| ATL         | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          | 32          |
| BEPC        | 1764        | 1768        | 1764        | 1768        | 1764        | 1768        | 1764        | 1768        | 1764        |
| CMMPA       | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         |
| GRE         | 2740        | 2972        | 2740        | 2972        | 2740        | 2972        | 2740        | 2972        | 2740        |
| GSE         | 1108        | 1175        | 1408        | 1475        | 1408        | 1475        | 1408        | 1475        | 1408        |
| HCPD        | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          | 51          |
| HMU         | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           | 3           |
| HSTG        | 157         | 157         | 157         | 157         | 157         | 157         | 157         | 157         | 157         |
| HUC         | 102         | 106         | 102         | 106         | 102         | 106         | 102         | 106         | 102         |
| LES         | 741         | 736         | 741         | 736         | 741         | 736         | 741         | 736         | 741         |
| MDU         | 550         | 487         | 550         | 487         | 550         | 487         | 550         | 487         | 550         |
| MEAN        | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         | 141         |
| MEC         | 5792        | 6058        | 5792        | 6058        | 5792        | 6058        | 5792        | 6058        | 5792        |
| MMPA        | 43          | 49          | 43          | 49          | 43          | 49          | 43          | 49          | 43          |
| MMU         | 18          | 20          | 18          | 20          | 18          | 20          | 18          | 20          | 18          |
| MP          | 1912        | 1885        | 1889        | 1885        | 1889        | 1885        | 1889        | 1885        | 1889        |
| MPC         | 633         | 670         | 657         | 670         | 657         | 670         | 657         | 670         | 657         |
| MPW         | 233         | 226         | 233         | 226         | 233         | 207         | 214         | 207         | 214         |
| MRES        | 512         | 531         | 512         | 531         | 512         | 531         | 512         | 531         | 512         |
| NPPD        | 3399        | 3426        | 3399        | 3426        | 3399        | 3426        | 3399        | 3426        | 3391        |
| NULM        | 71          | 75          | 71          | 75          | 71          | 75          | 71          | 75          | 71          |
| NWPS        | 312         | 332         | 312         | 332         | 312         | 332         | 312         | 332         | 312         |
| OPPD        | 2554        | 2180        | 3154        | 2780        | 3154        | 2780        | 3154        | 2780        | 3154        |
| OTP         | 670         | 703         | 670         | 703         | 670         | 703         | 670         | 703         | 670         |
| PELLA       | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          | 65          |
| RPU         | 190         | 189         | 190         | 189         | 190         | 189         | 190         | 189         | 190         |
| SMPA        | 609         | 591         | 609         | 591         | 609         | 591         | 609         | 591         | 609         |
| WAPA        | 2417        | 2299        | 2417        | 2299        | 2417        | 2299        | 2417        | 2299        | 2417        |
| WLMR        | 23          | 9           | 23          | 9           | 23          | 9           | 23          | 9           | 23          |
| WPPi        | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         | 129         |
| XCEL        | 7237        | 7678        | 7237        | 7678        | 7237        | 7678        | 7237        | 7678        | 7237        |
|             |             |             |             |             |             |             |             |             |             |
| MHEB        | 5416        | 5011        | 5416        | 5011        | 5416        | 5011        | 5416        | 5011        | 5416        |
| SPC         | 3455        | 3553        | 3455        | 3553        | 3455        | 3553        | 3455        | 3553        | 3455        |
|             |             |             |             |             |             |             |             |             |             |
| MAPP-US     | 34528       | 35068       | 35428       | 35968       | 35428       | 35949       | 35409       | 35949       | 35401       |
| MAPP-Canada | 8871        | 8565        | 8871        | 8565        | 8871        | 8565        | 8871        | 8565        | 8871        |
| MAPP-Total  | 43399       | 43633       | 44299       | 44533       | 44299       | 44514       | 44280       | 44514       | 44272       |

Generator Information - Existing Generators  
MEGAWATTS

Algona Municipal Utilities

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Algona     |              | WND                   | 0.5              | 0.7 | 2000-06           |
| Algona     | 3            | DFO                   | 0.5              | 0.5 | 1938-01           |
| Algona     | 4            | DFO                   | 0.0              | 0.0 | 1941-01           |
| Algona     | 5            | DFO                   | 0.0              | 0.0 | 1947-01           |
| Algona     | 6            | DFO                   | 3.2              | 3.2 | 1965-01           |
| Algona     | 7            | DFO                   | 4.4              | 4.4 | 1970-01           |
| Algona     | 8            | DFO                   | 4.8              | 4.8 | 1994-11           |
| Algona     | 9            | DFO                   | 4.7              | 4.7 | 1994-11           |

**Generator Information - Existing Generators**  
MEGAWATTS

*Ames Municipal Electric System*

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|------------|--------------|-----------------------|------------------|------|-------------------|
| Ames Plant | 7            | SUB                   | 33.0             | 33.0 | 1967-02           |
| Ames Plant | 8            | SUB                   | 70.0             | 70.0 | 1982-02           |
| Ames GT    | GT1          | DFO                   | 18.0             | 23.0 | 1972-02           |



Generator Information - Existing Generators  
MEGAWATTS

Atlantic Municipal Utilities

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Net Capacity Win | Date of Operation |
|------------|--------------|-----------------------|------------------|------------------|-------------------|
| Atlantic   | 1            | DFO                   | 4.4              | 4.4              | 1966-07           |
| Atlantic   | 6            | NG                    | 10.1             | 10.1             | 1999-07           |

Generator Information - Existing Generators  
MEGAWATTS

*Basin Electric Power Cooperative*

| Plant Name            | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------------|--------------|-----------------------|------------------|-------|-------------------|
| Antelope Valley       | 1            | LIG                   | 450.0            | 450.0 | 1984-07           |
| Antelope Valley       | 2            | LIG                   | 454.0            | 454.0 | 1986-07           |
| Laramie River Station | 1            | SUB                   | 550.0            | 550.0 | 1980-07           |
| Leland Olds           | 1            | LIG                   | 222.0            | 222.0 | 1966-01           |
| Leland Olds           | 2            | LIG                   | 447.0            | 447.0 | 1975-12           |
| Prairie Winds         | WTC1         | WND                   | 1.3              | 1.3   | 2000-01           |
| Prairie Winds         | WTC2         | WND                   | 1.3              | 1.3   | 2000-01           |
| Spirit Mound          | 1            | DFO                   | 52.0             | 60.0  | 1978-06           |
| Spirit Mound          | 2            | DFO                   | 44.0             | 60.0  | 1978-06           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Central Minnesota Municipal Power Agency**

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|--------------------|--------------|-----------------------|------------------|------|-------------------|
| Blue Earth L & W   | IC1          | DFO                   | 1.6              | 1.6  | 1960-11           |
| Blue Earth L & W   | IC3          | DFO                   | 2.0              | 2.0  | 1993-11           |
| Blue Earth L & W   | IC4          | DFO                   | 2.0              | 2.0  | 1993-11           |
| Blue Earth L & W   | IC5          | DFO                   | 2.0              | 2.0  | 1993-11           |
| Blue Earth L & W   | IC6          | DFO                   | 2.0              | 2.0  | 1996-02           |
| Delano Muni Util   | 1            | DFO                   | 1.1              | 1.1  | 1946-09           |
| Delano Muni Util   | 2            | DFO                   | 1.4              | 1.4  | 1999-04           |
| Delano Muni Util   | 3            | DFO                   | 1.1              | 1.1  | 1951-03           |
| Delano Muni Util   | 5            | DFO                   | 0.8              | 0.8  | 1973-02           |
| Delano Muni Util   | 6            | DFO                   | 1.4              | 1.4  | 1988-09           |
| Delano Muni Util   | 7            | DFO                   | 3.0              | 3.0  | 1992-08           |
| Delano Muni Util   | 8            | DFO                   | 3.1              | 3.1  | 1999-06           |
| Delano Muni Util   | 9            | DFO                   | 11.6             | 11.6 | 2002-07           |
| Fairfax Municipal  | 1            | DFO                   | 0.7              | 0.7  | 1990-01           |
| Fairfax Municipal  | 2a           | DFO                   | 1.7              | 1.7  | 2001-09           |
| Fairfax Municipal  | 4            | DFO                   | 0.4              | 0.4  | 1940-01           |
| Glencoe Lite & Pwr | 10           | DFO                   | 7.1              | 7.1  | 1988-05           |
| Glencoe Lite & Pwr | 11           | DFO                   | 4.9              | 4.9  | 1998-01           |
| Glencoe Lite & Pwr | 12           | DFO                   | 4.8              | 4.8  | 1998-05           |
| Glencoe Lite & Pwr | 5            | NG                    | 1.4              | 1.4  | 1956-05           |
| Glencoe Lite & Pwr | 6            | NG                    | 1.0              | 1.0  | 1956-05           |
| Glencoe Lite & Pwr | 7            | NG                    | 4.1              | 4.1  | 1963-05           |
| Glencoe Lite & Pwr | 8            | NG                    | 5.5              | 5.5  | 1969-05           |
| Glencoe Lite & Pwr | 9            | NG                    | 6.4              | 6.4  | 1973-05           |
| Janseville Muni    | 1            | NG                    | 1.4              | 1.4  | 1974-05           |
| Janseville Muni    | 2            | NG                    | 1.1              | 1.1  | 1964-05           |
| Janseville Muni    | 3            | NG                    | 0.7              | 0.7  | 1955-05           |
| Janseville Muni    | 4            | DFO                   | 1.8              | 1.8  | 1998-10           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Central Minnesota Municipal Power Agency**

| Plant Name           | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|----------------------|--------------|-----------------------|------------------|-----|-------------------|
| Kenyon Muni Util     | 5            | DFO                   | 1.8              | 1.8 | 1997-08           |
| Kenyon Muni Util     | 6            | DFO                   | 1.8              | 1.8 | 1997-08           |
| Kenyon Muni Util     | 7            | DFO                   | 1.8              | 1.8 | 1997-08           |
| Lake Crystal Util    | 1            | NG                    | 0.6              | 0.6 | 1954-05           |
| Lake Crystal Util    | 3            | NG                    | 1.9              | 1.9 | 1971-05           |
| Lake Crystal Util    | 4            | NG                    | 1.0              | 1.0 | 1957-05           |
| Lake Crystal Util    | 5            | DFO                   | 1.8              | 1.8 | 1999-10           |
| Madelia              | 1            | DFO                   | 3.2              | 3.2 | 2001-08           |
| Madelia              | 2            | NG                    | 2.1              | 2.1 | 1965-01           |
| Madelia              | 3            | NG                    | 1.1              | 1.1 | 1959-01           |
| Madelia              | 4            | NG                    | 4.3              | 4.3 | 1973-01           |
| Madelia              | 5            | NG                    | 1.4              | 1.4 | 1954-01           |
| Mt. Lake Muni Util   | 2            | NG                    | 1.2              | 1.2 | 1954-05           |
| Mt. Lake Muni Util   | 4            | NG                    | 1.9              | 1.9 | 1967-05           |
| Mt. Lake Muni Util   | 5            | NG                    | 1.4              | 1.4 | 1959-05           |
| Mt. Lake Muni Util   | 6            | DFO                   | 1.9              | 1.9 | 1998-02           |
| Mt. Lake Muni Util   | 7            | DFO                   | 1.9              | 1.9 | 1998-01           |
| Sleepy Eye Pub Util  | 1A           | DFO                   | 1.8              | 1.8 | 1999-04           |
| Sleepy Eye Pub Util  | 3            | DFO                   | 1.5              | 1.5 | 1999-06           |
| Sleepy Eye Pub Util  | 5            | DFO                   | 1.8              | 1.8 | 1999-06           |
| Sleepy Eye Pub Util  | IC2          | DFO                   | 1.8              | 1.8 | 2001-04           |
| Sleepy Eye Pub Util  | IC4          | DFO                   | 1.8              | 1.8 | 1995-07           |
| Springfield Pub Util | 1            | DFO                   | 1.6              | 1.6 | 1994-06           |
| Springfield Pub Util | 2            | DFO                   | 1.6              | 1.6 | 1996-04           |
| Springfield Pub Util | 3            | DFO                   | 1.6              | 1.6 | 1998-04           |
| Springfield Pub Util | 4            | DFO                   | 1.6              | 1.6 | 1998-04           |
| Springfield Pub Util | 5            | DFO                   | 1.6              | 1.6 | 2002-03           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Central Minnesota Municipal Power Agency**

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|--------------------|--------------|-----------------------|------------------|-----|-------------------|
| Truman Public Util | 1            | DFO                   | 0.2              | 0.2 | 1938-01           |
| Truman Public Util | 2            | DFO                   | 0.2              | 0.2 | 1938-01           |
| Truman Public Util | 3            | NG                    | 2.3              | 2.3 | 1975-01           |
| Truman Public Util | 4            | DFO                   | 0.7              | 0.7 | 1958-01           |
| Truman Public Util | 5            | NG                    | 0.8              | 0.8 | 1960-01           |
| Truman Public Util | 6            | DFO                   | 2.0              | 2.0 | 1997-01           |
| Windom Muni Util   | 2            | DFO                   | 2.0              | 2.0 | 2001-01           |
| Windom Muni Util   | 3            | DFO                   | 2.0              | 2.0 | 2001-01           |
| Windom Muni Util   | 4            | DFO                   | 2.0              | 2.0 | 2001-01           |
| Windom Muni Util   | GT1          | DFO                   | 3.0              | 3.0 | 1980-01           |

Generator Information - Existing Generators  
MEGAWATTS

GEN-SYS Energy

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|------------|--------------|-----------------------|------------------|------|-------------------|
| Alma       | 1            | BIT                   | 20.1             | 21.9 | 1947-09           |
| Alma       | 2            | BIT                   | 21.0             | 22.8 | 1947-10           |
| Alma       | 3            | BIT                   | 20.6             | 22.0 | 1947-10           |
| Alma       | 4            | BIT                   | 55.9             | 61.0 | 1957-04           |
| Alma       | 5            | BIT                   | 77.9             | 86.3 | 1960-01           |
| Arcadia    | 1            | DFO                   | 1.4              | 1.4  | 1955-01           |
| Arcadia    | 2            | DFO                   | 0.9              | 0.9  | 1948-01           |
| Arcadia    | 3            | DFO                   | 0.4              | 0.4  | 1940-01           |
| Arcadia    | 4            | DFO                   | 0.2              | 0.2  | 1930-01           |
| Arcadia    | 5            | DFO                   | 3.0              | 3.0  | 1971-01           |
| Arcadia    | 6            | DFO                   | 3.0              | 3.0  | 1987-01           |
| Arcadia    | 7            | DFO                   | 1.9              | 1.9  | 2002-05           |
| Arcadia    | 8            | DFO                   | 1.9              | 1.9  | 2002-05           |
| Arcadia    | 9            | DFO                   | 1.9              | 1.9  | 2002-12           |
| Argyle     | 2            | DFO                   | 1.0              | 1.0  | 1968-01           |
| Argyle     | 3            | DFO                   | 1.1              | 1.1  | 1970-01           |
| Argyle     | HYD          | WAT                   | 0.0              | 0.0  | 1968-01           |
| Cashon     | 3            | DFO                   | 0.4              | 0.4  | 1942-01           |
| Cashon     | 4            | DFO                   | 0.0              | 0.0  | 1932-01           |
| Cashon     | 5            | NG                    | 1.2              | 1.2  | 1970-01           |
| Cashon     | 6            | DFO                   | 1.8              | 1.8  | 2002-04           |
| Cumberland | 1            | DFO                   | 0.6              | 0.6  | 1945-01           |
| Cumberland | 2            | DFO                   | 0.2              | 0.2  | 1939-01           |
| Cumberland | 3            | DFO                   | 0.2              | 0.2  | 1939-01           |
| Cumberland | 4            | DFO                   | 1.1              | 1.1  | 1954-01           |
| Cumberland | 5            | NG                    | 1.9              | 1.9  | 1966-01           |
| Cumberland | 6            | DFO                   | 6.4              | 6.4  | 1979-01           |
| Cumberland | 7            | NG                    | 4.5              | 4.5  | 2002-08           |
| Cumberland | 8            | NG                    | 2.6              | 2.6  | 2002-08           |

**Generator Information - Existing Generators**  
MEGAWATTS

**GEN-SYS Energy**

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------|--------------|-----------------------|------------------|-------|-------------------|
| Elk Mound       | 1            | NG                    | 36.3             | 47.5  | 2001-07           |
| Elk Mound       | 2            | NG                    | 36.0             | 47.0  | 2001-07           |
| Elroy           | 5            | DFO                   | 2.3              | 2.3   | 1972-01           |
| Fennimore       | 4            | DFO                   | 1.1              | 1.1   | 1964-01           |
| Fennimore       | 5            | DFO                   | 1.0              | 1.0   | 1998-01           |
| Fennimore       | 6            | DFO                   | 2.0              | 2.0   | 1999-12           |
| Fennimore       | 7            | DFO                   | 2.0              | 2.0   | 1999-12           |
| Fennimore       | 8            | DFO                   | 2.0              | 2.0   | 1999-12           |
| Flambeau        | 1            | WAT                   | 6.9              | 6.9   | 1951-03           |
| Flambeau        | 2            | WAT                   | 7.0              | 7.0   | 1951-01           |
| Flambeau        | 3            | WAT                   | 8.1              | 8.1   | 1951-01           |
| Forest City     | 1            | DFO                   | 1.2              | 1.2   | 1958-01           |
| Forest City     | 2            | DFO                   | 2.2              | 2.2   | 1965-01           |
| Forest City     | 3            | DFO                   | 3.2              | 3.2   | 1968-01           |
| Forest City     | 4            | DFO                   | 6.1              | 6.1   | 1974-01           |
| Forest City     | 5            | DFO                   | 0.7              | 0.7   | 1955-01           |
| Forest City     | 6            | DFO                   | 7.4              | 7.4   | 2000-04           |
| Genoa           | ST3          | BIT                   | 353.1            | 377.8 | 1969-06           |
| John P. Madgett | 1            | SUB                   | 366.6            | 368.8 | 1979-11           |
| La Farge        | 1            | DFO                   | 1.6              | 1.6   | 1990-10           |
| Lanesboro       | 2            | WAT                   | 0.2              | 0.2   | 1968-01           |
| Lanesboro       | 3            | DFO                   | 0.8              | 0.8   | 1928-01           |
| Merrillan       | 1            | DFO                   | 0.8              | 0.8   | 1980-01           |
| Merrillan       | 2            | WAT                   | 0.0              | 0.0   | 1992-06           |
| New Lisbon      | 1            | DFO                   | 0.1              | 0.1   | 1930-01           |
| New Lisbon      | 2            | NG                    | 1.4              | 1.4   | 1966-01           |
| New Lisbon      | 3            | DFO                   | 0.2              | 0.2   | 1936-01           |
| New Lisbon      | 4            | DFO                   | 0.3              | 0.3   | 1948-01           |
| New Lisbon      | 5            | NG                    | 2.5              | 2.5   | 1977-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**GEN-SYS Energy**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Viola      | 1            | DFO                   | 0.0              | 0.0 | 1948-08           |
| Viola      | 2            | DFO                   | 0.0              | 0.0 | 1966-08           |
| Viola      | 3            | DFO                   | 1.8              | 1.8 | 2002-06           |



**Generator Information - Existing Generators**  
MEGAWATTS

**Great River Energy**

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|--------------------|--------------|-----------------------|------------------|-------|-------------------|
| Cambridge CT       | GT1          | DFO                   | 21.8             | 29.4  | 1978-05           |
| Coal Creek         | 1            | LIG                   | 542.7            | 542.7 | 1979-06           |
| Coal Creek         | 2            | LIG                   | 546.3            | 546.3 | 1980-10           |
| Coal Creek         | 3            | DFO                   | 2.1              | 2.1   | 1979-06           |
| Elk River          | 1            | MSW                   | 11.5             | 11.5  | 1951-01           |
| Elk River          | 2            | MSW                   | 10.9             | 10.9  | 1951-01           |
| Elk River          | 3            | MSW                   | 19.5             | 19.5  | 1959-01           |
| Lakefield Junction | 1            | NG                    | 81.1             | 91.7  | 2001-06           |
| Lakefield Junction | 2            | NG                    | 81.1             | 91.7  | 2001-06           |
| Lakefield Junction | 3            | NG                    | 81.1             | 91.7  | 2001-06           |
| Lakefield Junction | 4            | NG                    | 81.1             | 91.7  | 2001-06           |
| Lakefield Junction | 5            | NG                    | 81.1             | 91.7  | 2001-06           |
| Lakefield Junction | 6            | NG                    | 81.1             | 91.7  | 2001-06           |
| Maple Lake CT      | 5A           | DFO                   | 20.3             | 27.4  | 1978-05           |
| Pleasant Valley    | 11           | NG                    | 150.7            | 179.9 | 2001-05           |
| Pleasant Valley    | 12           | NG                    | 150.0            | 178.4 | 2001-05           |
| Pleasant Valley    | 13           | NG                    | 120.0            | 135.0 | 2002-05           |
| Rock Lake          | 1            | DFO                   | 22.1             | 28.6  | 1978-05           |
| St. Bonifacius     | 1            | DFO                   | 50.0             | 50.0  | 1978-06           |
| Stanton            | 1            | LIG                   | 187.4            | 187.4 | 1967-04           |
| Stanton            | 2            | DFO                   | 1.0              | 1.0   | 1967-04           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Harlan Municipal Utilities**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Harlan     | 1            | DFO                   | 2.0              | 2.0 | 2001-08           |
| Harlan     | 2            | DFO                   | 2.0              | 2.0 | 2001-07           |

Generator Information - Existing Generators  
MEGAWATTS

*Hastings Utilities*

| Plant Name           | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|----------------------|--------------|-----------------------|------------------|------|-------------------|
| Don Henry            | 1            | NG                    | 18.0             | 18.0 | 1972-06           |
| North Denver         | 4            | NG                    | 13.0             | 13.0 | 1957-12           |
| North Denver         | 5            | NG                    | 24.0             | 24.0 | 1967-10           |
| Whelen Energy Center | 1            | SUB                   | 77.0             | 77.0 | 1981-07           |

Generator Information - Existing Generators  
MEGAWATTS

Heartland Consumers Power District

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------|--------------|-----------------------|------------------|-------|-------------------|
| LARAMIE RIVER | 6204         | SUB                   | 568.0            | 568.0 | 1980-07           |

Generator Information - Existing Generators  
MEGAWATTS

*Hutchinson Utilities Commission*

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|----------------|--------------|-----------------------|------------------|------|-------------------|
| Hutch Plant #1 | 2            | NG                    | 2.0              | 2.0  | 1958-01           |
| Hutch Plant #1 | 3            | NG                    | 3.9              | 3.9  | 1968-01           |
| Hutch Plant #1 | 4            | NG                    | 3.9              | 3.9  | 1998-01           |
| Hutch Plant #1 | 5            | DFO                   | 1.7              | 1.7  | 1941-01           |
| Hutch Plant #1 | 6            | DFO                   | 1.7              | 1.7  | 1947-01           |
| Hutch Plant #1 | 7            | NG                    | 4.5              | 4.5  | 1964-01           |
| Hutch Plant #1 | 8            | NG                    | 11.0             | 13.3 | 1971-01           |
| Hutch Plant #2 | 2            | NG                    | 41.0             | 41.0 | 1994-11           |
| Hutch Plant #2 | 3            | WH                    | 10.0             | 10.0 | 1994-11           |
| Hutch Plant #2 | 9            | NG                    | 22.0             | 24.3 | 2001-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

*Lincoln Electric System*

| Plant Name  | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|-------------|--------------|-----------------------|------------------|------|-------------------|
| T Street    | 1            | NG                    | 30.5             | 34.9 | 1972-02           |
| Rokeby      | 1            | NG                    | 74.5             | 67.8 | 1975-06           |
| Rokeby      | 2            | NG                    | 88.3             | 85.0 | 1997-04           |
| Rokeby      | 3            | NG                    | 99.9             | 99.9 | 2001-05           |
| Rokeby      | BSU          | DFO                   | 2.7              | 2.7  | 1997-04           |
| Salt Valley | WT1          | WND                   | 0.7              | 0.7  | 1998-12           |
| Salt Valley | WT2          | WND                   | 0.7              | 0.7  | 1999-10           |

Generator Information - Existing Generators  
MEGAWATTS

**Marshall Municipal Utilities**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Date of Operation |
|------------|--------------|-----------------------|------------------|-------------------|
| MARSHALL   | UNIT 6       | DFC                   | 15.9             | 1905-05           |

Generator Information - Existing Generators  
MEGAWATTS

MidAmerican Energy Company

| Plant Name        | Generator ID | Energy Source<br>Primary | Net Capacity<br>Sum | Win   | Date of<br>Operation |
|-------------------|--------------|--------------------------|---------------------|-------|----------------------|
| Anderson Erickson | 7110         | DFO                      | 2.0                 | 2.0   | 2000-04              |
| Cedar Falls CT    | 1            | NG                       | 18.7                | 25.0  | 1968-01              |
| Cedar Falls CT    | 2            | NG                       | 19.8                | 21.8  | 2000-09              |
| Coralville GT     | 1            | NG                       | 16                  | 20    | 6/1/1970             |
| Coralville GT     | 2            | NG                       | 16                  | 20    | 6/1/1970             |
| Coralville GT     | 3            | NG                       | 16                  | 20    | 6/1/1970             |
| Coralville GT     | 4            | NG                       | 16                  | 20    | 6/1/1970             |
| Council Bluffs    | 1            | SUB                      | 43                  | 43    | 3/1/1954             |
| Council Bluffs    | 2            | SUB                      | 88                  | 88    | 10/1/1958            |
| Council Bluffs    | 3            | SUB                      | 690                 | 690   | 12/1/1978            |
| Duane Arnold      | 1            | NUC                      | 520.0               | 535.0 | 1975-02              |
| Electrifarm       | 1            | NG                       | 55.5                | 60.0  | 1975-05              |
| Electrifarm       | 2            | NG                       | 81.0                | 68.0  | 1978-01              |
| Electrifarm       | 3            | NG                       | 67.9                | 72.0  | 1978-01              |
| Estherville Pit   | 2            | DFO                      | 1.1                 | 1.1   | 12/1/1946            |
| Estherville Pit   | 3            | DFO                      | 2.7                 | 2.8   | 6/1/1960             |
| Estherville Pit   | 4            | DFO                      | 3.6                 | 3.6   | 6/1/1969             |
| Estherville Pit   | 5            | DFO                      | 3.6                 | 3.6   | 1/1/1969             |
| Estherville Pit   | 6            | DFO                      | 1.7                 | 1.7   | 1/1/1950             |
| Estherville Pit   | 7            | DFO                      | 2.7                 | 2.8   | 1/1/1960             |
| Indianola Pit     | 1            | DFO                      | 0.6                 | 0.6   | 8/1/1946             |
| Indianola Pit     | 2            | DFO                      | 1.2                 | 1.3   | 8/1/1949             |
| Indianola Pit     | 3            | DFO                      | 0.8                 | 0.8   | 8/1/1953             |
| Indianola Pit     | 4            | DFO                      | 1.2                 | 1.3   | 8/1/1961             |
| Indianola Pit     | 5            | DFO                      | 3.5                 | 3.5   | 8/1/1966             |
| Indianola Pit     | 6            | DFO                      | 4.8                 | 4.8   | 8/1/1970             |
| Indianola Pit     | 7            | DFO                      | 18.5                | 24    | 8/1/1977             |
| Indianola Pit     | 8            | DFO                      | 22.8                | 24    | 1/1/2000             |



Generator Information - Existing Generators  
MEGAWATTS

MidAmerican Energy Company

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|----------------|--------------|-----------------------|------------------|-------|-------------------|
| Knoxville Ind  | 7121         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7122         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7123         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7124         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7125         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7126         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7127         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Knoxville Ind  | 7128         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Louisa         | 1            | SUB                   | 700.0            | 700.0 | 1983-10           |
| Moline         | GT1          | NG                    | 16               | 20.3  | 5/1/1970          |
| Moline         | GT2          | NG                    | 16               | 20.3  | 5/1/1970          |
| Moline         | GT3          | NG                    | 16               | 20.3  | 5/1/1970          |
| Moline         | GT4          | NG                    | 16               | 20.3  | 5/1/1970          |
| Moline         | HY1          | WAT                   | 0.8              | 0.8   | 1/1/1942          |
| Moline         | HY2          | WAT                   | 0.8              | 0.8   | 1/1/1942          |
| Moline         | HY3          | WAT                   | 0.8              | 0.8   | 1/1/1942          |
| Moline         | HY4          | WAT                   | 0.8              | 0.8   | 1/1/1942          |
| Montezuma      | 1            | DFO                   | 0.2              | 0.2   | 1/1/1940          |
| Montezuma      | 4            | DFO                   | 0.5              | 0.5   | 1947-08           |
| Montezuma      | 5            | DFO                   | 1.0              | 1.1   | 1959-08           |
| Montezuma      | 6            | DFO                   | 1.6              | 1.7   | 1967-08           |
| Montezuma      | 7            | DFO                   | 2.3              | 2.4   | 1974-08           |
| Montezuma      | 8            | DFO                   | 1.8              | 1.8   | 1988-06           |
| Montezuma      | 9            | DFO                   | 1.8              | 1.8   | 2000-06           |
| Neal North     | 1            | SUB                   | 135              | 135   | 5/1/1964          |
| Neal North     | 2            | SUB                   | 300              | 300   | 5/1/1972          |
| Neal North     | 3            | SUB                   | 515              | 515   | 5/1/1975          |
| Neal South     | 4            | SUB                   | 624.0            | 624.0 | 1979-07           |
| Nimeca Diesels | DSL          | DFO                   | 56.4             | 56.4  | 1950-01           |
| Ottumwa        | 1            | SUB                   | 738.1            | 738.1 | 1981-05           |

Generator Information - Existing Generators  
MEGAWATTS

MidAmerican Energy Company

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------|--------------|-----------------------|------------------|-------|-------------------|
| Parr          | 1            | NG                    | 16               | 18    | 5/1/1969          |
| Parr          | 2            | NG                    | 16               | 18    | 5/1/1969          |
| Pleasant Hill | 1            | DFO                   | 37.0             | 47.0  | 1990-06           |
| Pleasant Hill | 2            | DFO                   | 37.0             | 47.0  | 1990-06           |
| Pleasant Hill | 3            | DFO                   | 83.0             | 100.0 | 1994-06           |
| River Hills   | 1            | NG                    | 15               | 18.8  | 5/1/1966          |
| River Hills   | 2            | NG                    | 15               | 18.8  | 5/1/1966          |
| River Hills   | 3            | NG                    | 15               | 18.8  | 5/1/1966          |
| River Hills   | 4            | NG                    | 15               | 18.8  | 5/1/1966          |
| River Hills   | 5            | NG                    | 15               | 18.8  | 10/1/1967         |
| River Hills   | 6            | NG                    | 15               | 18.8  | 10/1/1967         |
| River Hills   | 7            | NG                    | 15               | 18.8  | 4/1/1968          |
| River Hills   | 8            | NG                    | 15               | 18.8  | 4/1/1968          |
| Riverside     | 3HS          | SUB                   | 5                | 5     | 5/1/1949          |
| Riverside     | 5            | SUB                   | 130              | 130   | 6/1/1961          |
| Shenandoah    | 7106         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7111         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7112         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7113         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7114         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7115         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7116         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7117         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7119         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Shenandoah    | 7120         | DFO                   | 2.0              | 2.0   | 2000-04           |
| Spencer       | GT1          | JF                    | 17.2             | 20.0  | 1970-01           |
| Streeter St   | 6            | NG                    | 20               | 16.5  | 9/1/1963          |
| Streeter St   | 7            | BIT                   | 36.6             | 36.6  | 6/1/1973          |
| Sycamore      | 1            | NG                    | 74.5             | 95.0  | 1974-08           |
| Sycamore      | 2            | NG                    | 74.5             | 95.0  | 1974-11           |

**Generator Information - Existing Generators**  
MEGAWATTS

**MidAmerican Energy Company**

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|--------------------|--------------|-----------------------|------------------|------|-------------------|
| Univ Northern IA   | 1            | BIT                   | 7.4              | 7.8  | 1982-01           |
| University of Iowa | IC           | DFO                   | 1.7              | 1.8  | 1998-06           |
| Waterloo           | 7101         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7102         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7103         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7104         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7105         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7107         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7108         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7109         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waterloo           | 7118         | DFO                   | 2.0              | 2.0  | 2000-04           |
| Waverly North Pit  | 10           | NG                    | 7.0              | 7.0  | 1993-04           |
| Waverly North Pit  | 5            | NG                    | 1.2              | 1.2  | 1978-08           |
| Waverly North Pit  | 6            | NG                    | 1.4              | 1.4  | 1952-08           |
| Waverly North Pit  | 7            | NG                    | 3.5              | 3.5  | 1958-08           |
| Waverly North Pit  | 8            | NG                    | 3.8              | 3.8  | 1967-08           |
| Waverly North Pit  | 9            | NG                    | 3.8              | 3.8  | 1967-08           |
| Waverly South Pit  | 11           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Waverly South Pit  | 12           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Waverly South Pit  | 13           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Waverly South Pit  | 14           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Waverly South Pit  | 15           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Waverly South Pit  | 16           | DFO                   | 2.0              | 2.0  | 1999-01           |
| Webster City       | 6            | DFO                   | 20.7             | 25.2 | 1972-04           |
| Wisdom             | 1            | BIT                   | 37.3             | 38.0 | 1960-04           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Minnesota Municipal Power Agency**

| Plant Name              | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|-------------------------|--------------|-----------------------|------------------|------|-------------------|
| Minnesota River Station | U001         | NG                    | 43.0             | 49.0 | 2001-05           |

Generator Information - Existing Generators  
MEGAWATTS

Minnesota Power

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------|--------------|-----------------------|------------------|-------|-------------------|
| Aitkin        | 1            | DFO                   | 0.1              | 0.1   | 1936-05           |
| Aitkin        | 5            | DFO                   | 0.8              | 0.8   | 1947-06           |
| Aitkin        | 6            | DFO                   | 1.2              | 1.2   | 1953-06           |
| Blanchard     | 1            | WAT                   | 5.5              | 5.5   | 1925-02           |
| Blanchard     | 2            | WAT                   | 5.5              | 5.5   | 1925-02           |
| Blanchard     | 3            | WAT                   | 5.5              | 5.5   | 1988-08           |
| Boise         | 1            | WDS                   | 4.2              | 4.2   | 1905-04           |
| Boise         | 2            | WDS                   | 4.2              | 4.2   | 1905-04           |
| Boise         | 3            | WDS                   | 8.5              | 8.5   | 1905-05           |
| Boise         | 4            | WDS                   | 8.7              | 8.7   | 1905-04           |
| Boise         | 5            | WDS                   | 6.9              | 6.9   | 1905-05           |
| Boise         | HYD          | WAT                   | 13.3             | 13.3  | 1948-01           |
| Clay Boswell  | 1            | SUB                   | 69.0             | 69.0  | 1958-07           |
| Clay Boswell  | 2            | SUB                   | 69.0             | 69.0  | 1960-01           |
| Clay Boswell  | 3            | SUB                   | 350.5            | 350.5 | 1973-05           |
| Clay Boswell  | 4            | SUB                   | 424.4            | 424.4 | 1980-05           |
| Clay Boswell  | D4           | DFO                   | 0.7              | 0.7   | 1980-04           |
| Dahlberg      | TOT          | DFO                   | 16.8             | 16.8  | 1950-01           |
| Fond Du Lac   | 1            | WAT                   | 11.0             | 11.0  | 1924-01           |
| Knife Falls   | 1            | WAT                   | 0.6              | 0.6   | 1922-01           |
| Knife Falls   | 2            | WAT                   | 0.6              | 0.6   | 1922-01           |
| Knife Falls   | 3            | WAT                   | 0.6              | 0.6   | 1922-01           |
| Little Falls  | 1            | WAT                   | 0.8              | 0.8   | 1919-01           |
| Little Falls  | 2            | WAT                   | 0.8              | 0.8   | 1919-01           |
| Little Falls  | 3            | WAT                   | 1.1              | 1.1   | 1920-01           |
| Little Falls  | 4            | WAT                   | 1.4              | 1.4   | 1979-11           |
| Little Falls  | 5            | WAT                   | 0.3              | 0.3   | 1906-01           |
| Little Falls  | 6            | WAT                   | 0.3              | 0.3   | 1906-01           |
| M. L. Hibbard | 3            | WDS                   | 34.4             | 34.4  | 1949-01           |
| M. L. Hibbard | 4            | WDS                   | 16.2             | 11.2  | 1951-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Minnesota Power**

| Plant Name           | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|----------------------|--------------|-----------------------|------------------|-------|-------------------|
| Milton R Young       | 2            | LIG                   | 317.3            | 322.3 | 1977-04           |
| Pillager             | 1            | WAT                   | 0.9              | 0.9   | 1917-01           |
| Pillager             | 2            | WAT                   | 0.9              | 0.9   | 1917-01           |
| Potlatch Brainerd    | 1            | WDS                   | 0.5              | 0.5   | 1905-05           |
| Potlatch Brainerd    | HYD          | WAT                   | 1.7              | 1.9   | 1916-01           |
| Prairie River        | 1            | WAT                   | 0.4              | 0.4   | 1920-04           |
| Prairie River        | 2            | WAT                   | 0.4              | 0.4   | 1920-04           |
| Rapids Energy Center | 6            | WDS                   | 14.1             | 14.1  | 1905-05           |
| Rapids Energy Center | 7            | WDS                   | 15.2             | 15.2  | 1905-06           |
| Rapids Energy Center | HYD          | WAT                   | 0.7              | 1.2   | 1917-01           |
| SAPPI Cloquet        | 3            | WDS                   | 20.6             | 20.6  | 1905-05           |
| SAPPI Cloquet        | 4            | WDS                   | 37.2             | 37.2  | 1997-12           |
| SAPPI Cloquet        | 5            | WDS                   | 22.9             | 22.9  | 2001-05           |
| SAPPI Cloquet        | HYD          | WAT                   | 2.2              | 2.7   | 1928-01           |
| Scanlon              | 1            | WAT                   | 0.4              | 0.4   | 1923-01           |
| Scanlon              | 2            | WAT                   | 0.4              | 0.4   | 1923-01           |
| Scanlon              | 3            | WAT                   | 0.4              | 0.4   | 1923-01           |
| Scanlon              | 4            | WAT                   | 0.4              | 0.4   | 1923-01           |
| Silver Bay PC        | NET          | SUB                   | 92.5             | 92.5  | 1955-10           |
| Syl Laskin           | 1            | SUB                   | 55.0             | 55.0  | 1953-06           |
| Syl Laskin           | 2            | SUB                   | 55.0             | 55.0  | 1953-09           |
| Sylvan               | 1            | WAT                   | 0.6              | 0.6   | 1913-01           |
| Sylvan               | 2            | WAT                   | 0.6              | 0.6   | 1913-01           |
| Sylvan               | 3            | WAT                   | 0.6              | 0.6   | 1915-01           |
| Taconite Harbor      | 1            | SUB                   | 66.6             | 66.6  | 1957-11           |
| Taconite Harbor      | 2            | SUB                   | 67.2             | 67.2  | 1957-11           |
| Taconite Harbor      | 3            | SUB                   | 66.1             | 66.1  | 1968-12           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Minnesota Power**

| Plant Name  | Generator ID | Energy Source Primary | Net Capacity Sum | Net Capacity Win | Date of Operation |
|-------------|--------------|-----------------------|------------------|------------------|-------------------|
| Thomson     | 1            | WAT                   | 12.1             | 12.1             | 1907-01           |
| Thomson     | 2            | WAT                   | 10.8             | 10.8             | 1907-01           |
| Thomson     | 3            | WAT                   | 10.6             | 10.6             | 1907-01           |
| Thomson     | 4            | WAT                   | 13.4             | 13.4             | 1914-01           |
| Thomson     | 5            | WAT                   | 12.2             | 12.2             | 1919-01           |
| Thomson     | 6            | WAT                   | 12.2             | 12.2             | 1949-01           |
| Two Harbors | 3            | DFO                   | 2.0              | 2.0              | 1972-03           |
| Winton      | 2            | WAT                   | 2.0              | 2.0              | 1923-08           |
| Winton      | 3            | WAT                   | 2.0              | 2.0              | 1923-09           |

**Generator Information - Existing Generators**  
MEGAWATTS

*Minnkota Power Cooperative, Inc.*

| Plant Name                  | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------------------|--------------|-----------------------|------------------|-------|-------------------|
| Coyote                      | 1            | LIG                   | 427.0            | 427.0 | 1981-05           |
| Drayton                     | 1            | SUB                   | 6.8              | 6.8   | 1965-09           |
| Fargo                       | 1            | DFO                   | 2.0              | 2.0   | 2002-02           |
| Grand Forks                 | 9            | DFO                   | 1.1              | 1.1   | 1949-08           |
| Harwood                     | 1            | DFO                   | 1.5              | 1.5   | 1947-10           |
| Harwood                     | 2            | DFO                   | 1.6              | 1.6   | 1947-10           |
| Harwood                     | 3            | DFO                   | 1.6              | 1.6   | 1947-10           |
| Hillsboro                   | 1            | SUB                   | 13.3             | 13.3  | 1986-08           |
| Infinity Wind - Petersburg  | 1            | WND                   | 0.9              | 0.9   | 2002-07           |
| Infinity Wind - Valley City | 1            | WND                   | 0.9              | 0.9   | 2002-01           |
| Pottlatch                   | 1            | WDS                   | 5.5              | 5.5   | 1992-05           |
| Young                       | 1            | LIG                   | 250.0            | 250.0 | 1970-11           |
| Young                       | 2            | LIG                   | 455.0            | 447.0 | 1977-05           |



**Generator Information - Existing Generators**  
MEGAWATTS

**Missouri River Energy Services**

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|---------------|--------------|-----------------------|------------------|------|-------------------|
| Alexandria    | IC1          | DFO                   | 0.6              | 0.6  | 1948-01           |
| Alexandria    | IC2          | DFO                   | 3.5              | 3.5  | 1967-01           |
| Alexandria    | IC3          | DFO                   | 3.5              | 3.5  | 1967-01           |
| Benson        | 5            | DFO                   | 1.0              | 1.0  | 1948-01           |
| Benson        | 6            | DFO                   | 1.3              | 1.3  | 1955-01           |
| Benson        | 7            | DFO                   | 2.0              | 2.0  | 2002-05           |
| Benson        | 8            | DFO                   | 2.0              | 2.0  | 2002-05           |
| Benson        | 9            | DFO                   | 2.0              | 2.0  | 2002-05           |
| Benson        | 10           | DFO                   | 2.0              | 2.0  | 2002-05           |
| Benson        | 11           | DFO                   | 2.0              | 2.0  | 2002-05           |
| Denison       | 1            | DFO                   | 1.8              | 1.8  | 1998-11           |
| Detroit Lakes | 1            | DFO                   | 9.6              | 10.0 | 1968-07           |
| Hillsboro     | 1            | DFO                   | 2.0              | 2.0  | 2002-07           |
| Hillsboro     | 2            | DFO                   | 2.0              | 2.0  | 2002-07           |
| Kimballton    | 5            | DFO                   | 0.4              | 0.4  | 1970-01           |
| Lakefield     | 1            | DFO                   | 0.2              | 0.2  | 1936-01           |
| Lakefield     | 2            | DFO                   | 0.3              | 0.3  | 1936-01           |
| Lakefield     | 3            | DFO                   | 0.5              | 0.5  | 1939-01           |
| Lakefield     | 4            | DFO                   | 0.8              | 0.8  | 1948-01           |
| Lakefield     | 5            | DFO                   | 1.0              | 1.0  | 1985-01           |
| Luverne       | 4B           | DFO                   | 0.6              | 0.6  | 1941-01           |
| Luverne       | 4C           | DFO                   | 3.4              | 3.4  | 1967-06           |
| Moorhead      | 6            | DFO                   | 6.2              | 9.7  | 1961-01           |
| Primghar      | 4            | DFO                   | 0.5              | 0.5  | 1972-01           |
| Primghar      | 5            | DFO                   | 1.0              | 1.0  | 1992-06           |
| Rock Rapids   | 1            | DFO                   | 2.5              | 2.5  | 1968-04           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Missouri River Energy Services**

| Plant Name   | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|--------------|--------------|-----------------------|------------------|------|-------------------|
| St. James    | 1            | DFO                   | 2.0              | 2.0  | 2002-07           |
| St. James    | 2            | DFO                   | 2.0              | 2.0  | 2002-07           |
| St. James    | 3            | DFO                   | 2.0              | 2.0  | 2002-07           |
| St. James    | 4            | DFO                   | 2.0              | 2.0  | 2002-07           |
| St. James    | 5            | DFO                   | 2.0              | 2.0  | 2002-07           |
| St. James    | 6            | DFO                   | 2.0              | 2.0  | 2002-07           |
| Watertown PP | 1            | DFO                   | 51.4             | 65.0 | 1978-01           |
| Westbrook    | 2            | DFO                   | 2.2              | 2.2  | 2002-03           |
| Worthington  | 1            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 2            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 3            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 4            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 5            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 6            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 7            | DFO                   | 2.0              | 2.0  | 2002-08           |
| Worthington  | 8            | WND                   | 0.0              | 0.0  | 2002-07           |
| Worthington  | 9            | WND                   | 0.0              | 0.0  | 2002-07           |
| Worthington  | 10           | WND                   | 0.0              | 0.0  | 2002-07           |
| Worthington  | 11           | WND                   | 0.0              | 0.0  | 2002-07           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Montana-Dakota Utilities Co.**

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Net Capacity Win | Date of Operation |
|---------------|--------------|-----------------------|------------------|------------------|-------------------|
| Glendive CT   | 1            | NG                    | 34.1             | 42.0             | 1979-06           |
| Heskett       | 1            | LIG                   | 29.5             | 29.5             | 1954-11           |
| Heskett       | 2            | LIG                   | 72.6             | 72.6             | 1963-11           |
| Lewis & Clark | 1            | LIG                   | 52.3             | 47.6             | 1958-10           |
| Miles City CT | 1            | NG                    | 24.3             | 23.4             | 1972-05           |
| Williston CT  | 2            | NG                    | 4.7              | 5.2              | 1953-11           |
| Williston CT  | 3            | NG                    | 4.9              | 5.4              | 1953-11           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Municipal Energy Association of Nebraska**

| Plant Name  | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|-------------|--------------|-----------------------|------------------|-----|-------------------|
| Ansley      | 1            | NG                    | 0.4              | 0.4 | 1972-01           |
| Ansley      | 2            | NG                    | 0.8              | 0.8 | 1968-01           |
| Arnold      | 1            | DFO                   | 0.5              | 0.5 | 1960-08           |
| Arnold      | 2            | DFO                   | 0.1              | 0.1 | 1928-08           |
| Arnold      | 3            | DFO                   | 0.2              | 0.2 | 1941-01           |
| Arnold      | 4            | DFO                   | 0.2              | 0.2 | 1949-01           |
| Beaver City | 1            | DFO                   | 0.5              | 0.5 | 1958-01           |
| Beaver City | 2            | DFO                   | 0.3              | 0.4 | 1961-01           |
| Beaver City | 3            | DFO                   | 0.3              | 0.3 | 1947-10           |
| Beaver City | 4            | DFO                   | 0.9              | 0.9 | 1967-01           |
| Benkelman   | 1            | DFO                   | 0.8              | 0.8 | 1956-01           |
| Benkelman   | 2            | DFO                   | 0.3              | 0.3 | 1941-08           |
| Blue Hill   | 5            | DFO                   | 0.8              | 0.8 | 1964-01           |
| Blue Hill   | OP4          | DFO                   | 0.4              | 0.4 | 1948-01           |
| Broken Bow  | 1            | NG                    | 0.5              | 0.5 | 1943-01           |
| Broken Bow  | 2            | NG                    | 3.5              | 3.5 | 1969-01           |
| Broken Bow  | 3            | NG                    | 0.7              | 0.7 | 1948-01           |
| Broken Bow  | 4            | NG                    | 0.8              | 0.8 | 1952-01           |
| Broken Bow  | 5            | NG                    | 1.0              | 1.0 | 1952-01           |
| Broken Bow  | 6            | NG                    | 2.0              | 2.0 | 1963-01           |
| Burwell     | 1            | DFO                   | 1.4              | 1.4 | 1972-01           |
| Burwell     | 2            | DFO                   | 0.9              | 0.9 | 1967-01           |
| Burwell     | 3            | DFO                   | 0.7              | 0.7 | 1962-01           |
| Burwell     | 4            | DFO                   | 0.7              | 0.7 | 1955-01           |
| Callaway    | 1            | DFO                   | 0.2              | 0.2 | 1936-01           |
| Callaway    | 2            | DFO                   | 0.2              | 0.2 | 1848-01           |
| Callaway    | 3            | DFO                   | 0.5              | 0.5 | 1958-01           |
| Chappell    | 1            | DFO                   | 0.2              | 0.2 | 1947-01           |
| Chappell    | 5            | DFO                   | 1.0              | 1.0 | 1982-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Municipal Energy Association of Nebraska**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|------------|--------------|-----------------------|------------------|------|-------------------|
| Crete      | 1            | NG                    | 0.4              | 0.4  | 1939-01           |
| Crete      | 2            | NG                    | 1.2              | 1.2  | 1955-01           |
| Crete      | 3            | NG                    | 1.0              | 1.0  | 1951-01           |
| Crete      | 4            | NG                    | 1.0              | 1.0  | 1947-01           |
| Crete      | 5            | NG                    | 2.6              | 2.6  | 1962-01           |
| Crete      | 6            | NG                    | 3.4              | 3.4  | 1965-01           |
| Crete      | 7            | NG                    | 5.1              | 6.1  | 1972-01           |
| Curtis     | 2            | NG                    | 0.8              | 0.8  | 1955-01           |
| Curtis     | 3            | NG                    | 1.0              | 1.0  | 1969-01           |
| Curtis     | 4            | NG                    | 1.2              | 1.2  | 1975-01           |
| Fairbury   | 1            | NG                    | 3.8              | 4.0  | 1948-08           |
| Fairbury   | 2            | NG                    | 2.5              | 2.5  | 1948-01           |
| Fairbury   | 4            | NG                    | 11.8             | 11.8 | 1966-01           |
| Oxford     | 2            | NG                    | 0.5              | 0.5  | 1952-01           |
| Oxford     | 3            | NG                    | 0.8              | 0.8  | 1956-01           |
| Oxford     | 4            | NG                    | 0.4              | 0.4  | 1956-01           |
| Oxford     | 5            | NG                    | 1.2              | 1.3  | 1972-01           |
| Pender     | 1            | DFO                   | 1.1              | 1.1  | 1967-01           |
| Pender     | 2            | NG                    | 1.6              | 1.6  | 1973-01           |
| Pender     | 3            | DFO                   | 0.4              | 0.4  | 1953-01           |
| Pender     | 4            | DFO                   | 0.9              | 0.9  | 1961-01           |
| Pender     | 5            | NG                    | 0.2              | 0.2  | 1939-09           |
| Red Cloud  | 1            | DFO                   | 0.5              | 0.5  | 1950-01           |
| Red Cloud  | 2            | NG                    | 0.5              | 0.5  | 1953-01           |
| Red Cloud  | 3            | NG                    | 1.0              | 1.0  | 1960-01           |
| Red Cloud  | 4            | NG                    | 1.3              | 1.3  | 1968-01           |
| Red Cloud  | 5            | NG                    | 2.2              | 2.2  | 1974-01           |
| Sargent    | 1            | NG                    | 0.0              | 0.0  | 1968-01           |
| Sargent    | 3            | NG                    | 0.7              | 0.7  | 1964-01           |
| Sargent    | 4            | NG                    | 0.3              | 0.3  | 1954-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Municipal Energy Association of Nebraska**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Stuart     | 1            | DFO                   | 0.7              | 0.7 | 1965-01           |
| Stuart     | 2            | DFO                   | 0.8              | 0.8 | 1996-01           |
| Stuart     | 3            | DFO                   | 0.3              | 0.3 | 1954-01           |
| Stuart     | 4            | DFO                   | 0.3              | 0.3 | 1946-01           |
| West Point | 2            | NG                    | 1.1              | 1.1 | 1959-01           |
| West Point | 3            | NG                    | 1.2              | 1.2 | 1971-01           |
| West Point | 4            | NG                    | 2.3              | 2.3 | 1965-08           |
| West Point | 5            | NG                    | 3.6              | 3.6 | 1971-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Muscatine Power and Water**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|------------|--------------|-----------------------|------------------|-------|-------------------|
| Muscatine  | 7            | SUB                   | 19.0             | 19.0  | 1958-04           |
| Muscatine  | 8            | SUB                   | 34.4             | 24.9  | 1969-01           |
| Muscatine  | 8A           | SUB                   | 15.9             | 18.3  | 2000-07           |
| Muscatine  | 9            | SUB                   | 164.2            | 164.2 | 1983-04           |

Generator Information - Existing Generators  
MEGAWATTS

*Nebraska Public Power District*

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|----------------|--------------|-----------------------|------------------|-------|-------------------|
| Auburn         | 1            | NG                    | 2.1              | 2.1   | 1982-01           |
| Auburn         | 2            | NG                    | 0.5              | 0.5   | 1949-01           |
| Auburn         | 4            | NG                    | 3.3              | 3.3   | 1993-01           |
| Auburn         | 5            | NG                    | 3.0              | 3.0   | 1973-01           |
| Auburn         | 6            | NG                    | 2.2              | 2.2   | 1967-01           |
| Auburn         | 7            | NG                    | 5.2              | 5.2   | 1987-01           |
| Belleville, KS | 4            | NG                    | 0.8              | 0.8   | 1955-01           |
| Belleville, KS | 6            | NG                    | 3.1              | 3.1   | 1966-01           |
| Belleville, KS | 7            | NG                    | 4.1              | 4.1   | 1971-01           |
| Burdick        | 1            | NG                    | 16.5             | 16.5  | 1957-10           |
| Burdick        | 2            | NG                    | 22.0             | 22.0  | 1963-08           |
| Burdick        | 3            | NG                    | 54.0             | 54.0  | 1972-02           |
| Burdick        | GT-1         | NG                    | 13.0             | 13.0  | 1968-03           |
| Cambridge      | 1            | DFO                   | 0.6              | 0.6   | 1958-01           |
| Cambridge      | 2            | DFO                   | 0.7              | 0.7   | 1963-01           |
| Cambridge      | 3            | DFO                   | 1.3              | 1.3   | 1972-01           |
| Canaday        | 1            | NG                    | 118.0            | 119.0 | 1958-01           |
| Columbus       | 1            | WAT                   | 11.1             | 11.1  | 1936-01           |
| Columbus       | 2            | WAT                   | 12.6             | 12.6  | 1936-01           |
| Columbus       | 3            | WAT                   | 11.9             | 11.9  | 1936-01           |
| Cooper         | 1            | NUC                   | 758.0            | 776.0 | 1974-03           |
| David City     | 1            | NG                    | 1.3              | 1.3   | 1960-01           |
| David City     | 2            | DFO                   | 0.8              | 0.8   | 1949-01           |
| David City     | 3            | NG                    | 0.9              | 0.9   | 1955-01           |
| David City     | 4            | NG                    | 1.8              | 1.8   | 1966-01           |
| David City     | 5            | DFO                   | 1.3              | 1.3   | 1996-12           |
| David City     | 6            | DFO                   | 1.3              | 1.3   | 1996-12           |
| David City     | 7            | DFO                   | 1.3              | 1.3   | 1996-12           |
| Deshler        | 1            | DFO                   | 0.3              | 0.3   | 2001-01           |
| Deshler        | 2            | DFO                   | 0.3              | 0.3   | 1950-01           |



**Generator Information - Existing Generators**  
MEGAWATTS

**Nebraska Public Power District**

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|----------------|--------------|-----------------------|------------------|-------|-------------------|
| Deshler        | 3            | DFO                   | 1.1              | 1.1   | 1998-01           |
| Deshler        | 4            | DFO                   | 0.6              | 0.6   | 1956-01           |
| Emerson        | 2            | DFO                   | 1.2              | 1.2   | 1968-01           |
| Emerson        | 3            | DFO                   | 0.2              | 0.2   | 1948-01           |
| Emerson        | 4            | DFO                   | 0.4              | 0.4   | 1958-01           |
| Franklin       | 1            | NG                    | 0.7              | 0.7   | 1983-01           |
| Franklin       | 2            | NG                    | 1.4              | 1.4   | 1974-01           |
| Franklin       | 3            | NG                    | 1.1              | 1.1   | 1968-01           |
| Franklin       | 4            | NG                    | 0.7              | 0.7   | 1955-01           |
| Gentleman      | 1            | SUB                   | 665.0            | 665.0 | 1979-04           |
| Gentleman      | 2            | SUB                   | 700.0            | 700.0 | 1982-01           |
| Hallam         | 1            | NG                    | 52.0             | 56.0  | 1973-06           |
| Hebron         | 1            | DFO                   | 52.0             | 56.0  | 1973-06           |
| Jeffrey        | 1            | WAT                   | 9.0              | 9.0   | 1941-01           |
| Jeffrey        | 2            | WAT                   | 9.0              | 9.0   | 1941-01           |
| Johnson 1      | 1            | WAT                   | 9.0              | 9.0   | 1941-04           |
| Johnson 1      | 2            | WAT                   | 9.0              | 9.0   | 1941-04           |
| Johnson 2      | 1            | WAT                   | 18.0             | 18.0  | 1941-04           |
| Kearney        | 1            | WAT                   | 1.0              | 0.0   | 1921-01           |
| Kingsley Hydro | 1            | WAT                   | 38.0             | 38.0  | 1984-11           |
| Lyons          | 2            | DFO                   | 0.2              | 0.2   | 1953-01           |
| Lyons          | 3            | DFO                   | 0.3              | 0.3   | 1960-01           |
| Lyons          | 4            | DFO                   | 0.6              | 0.6   | 1967-01           |
| Madison        | 1            | NG                    | 1.7              | 1.7   | 1969-01           |
| Madison        | 2            | NG                    | 1.0              | 1.0   | 1959-01           |
| Madison        | 3            | NG                    | 0.9              | 0.9   | 1953-01           |
| Madison        | 4            | DFO                   | 0.5              | 0.5   | 1946-01           |
| Mccook         | 1            | DFO                   | 51.0             | 54.0  | 1973-06           |
| Mobiles        | 1            | DFO                   | 1.0              | 1.0   | 1980-01           |
| Mobiles        | 2            | DFO                   | 1.6              | 1.6   | 1996-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Nebraska Public Power District**

| Plant Name   | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|--------------|--------------|-----------------------|------------------|-------|-------------------|
| Monroe       | 1            | WAT                   | 1.0              | 0.4   | 1936-01           |
| Monroe       | 2            | WAT                   | 1.0              | 0.4   | 1936-01           |
| Monroe       | 3            | WAT                   | 1.0              | 0.4   | 1936-01           |
| Mullen       | 1            | DFO                   | 0.4              | 0.4   | 1958-01           |
| Mullen       | 2            | DFO                   | 0.7              | 0.7   | 1966-01           |
| North Platte | 1            | WAT                   | 12.0             | 12.0  | 1935-01           |
| North Platte | 2            | WAT                   | 12.0             | 12.0  | 1935-01           |
| Ord          | 1            | DFO                   | 5.0              | 5.0   | 1973-01           |
| Ord          | 2            | DFO                   | 1.0              | 1.0   | 1966-01           |
| Ord          | 3            | DFO                   | 2.0              | 2.0   | 1963-01           |
| Ord          | 4            | DFO                   | 1.4              | 1.4   | 1997-04           |
| Ord          | 5            | DFO                   | 1.4              | 1.4   | 1997-04           |
| Platte       | 1            | SUB                   | 100.0            | 100.0 | 1982-12           |
| Sheldon      | 1            | SUB                   | 105.0            | 105.0 | 1961-01           |
| Sheldon      | 2            | SUB                   | 120.0            | 120.0 | 1965-01           |
| Spalding     | 1            | DFO                   | 0.0              | 0.0   | 1944-01           |
| Spalding     | 2            | DFO                   | 0.4              | 0.4   | 1955-01           |
| Spalding     | 3            | DFO                   | 1.4              | 1.4   | 1975-01           |
| Spalding     | 4            | DFO                   | 0.2              | 0.2   | 1999-01           |
| Spalding     | 5            | DFO                   | 0.3              | 0.3   | 2001-01           |
| Spencer      | 1            | WAT                   | 0.8              | 0.8   | 1927-01           |
| Spencer      | 2            | WAT                   | 1.0              | 1.0   | 1952-01           |
| Sutherland   | 1            | DFO                   | 0.5              | 0.5   | 1952-01           |
| Sutherland   | 2            | DFO                   | 0.9              | 0.9   | 1959-01           |
| Sutherland   | 3            | DFO                   | 0.0              | 0.0   | 1935-01           |
| Sutherland   | 4            | DFO                   | 1.4              | 1.4   | 1964-01           |
| Wahoo        | 1            | NG                    | 1.7              | 1.7   | 1960-01           |
| Wahoo        | 2            | NG                    | 0.0              | 0.0   | 1936-01           |
| Wahoo        | 3            | NG                    | 3.6              | 3.6   | 1973-01           |
| Wahoo        | 4            | NG                    | 0.0              | 0.0   | 1947-01           |

Generator Information - Existing Generators  
MEGAWATTS

*Nebraska Public Power District*

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Wahoo      | 5            | NG                    | 1.8              | 1.8 | 1952-01           |
| Wahoo      | 6            | NG                    | 2.9              | 2.9 | 1969-01           |
| Wakefield  | 2            | NG                    | 0.5              | 0.5 | 1955-01           |
| Wakefield  | 4            | NG                    | 0.7              | 0.7 | 1961-01           |
| Wakefield  | 5            | NG                    | 1.1              | 1.1 | 1966-01           |
| Wakefield  | 6            | NG                    | 1.1              | 1.1 | 1971-01           |
| Wayne      | 1            | DFO                   | 0.8              | 0.8 | 1951-01           |
| Wayne      | 2            | DFO                   | 0.0              | 0.0 | 1947-01           |
| Wayne      | 3            | DFO                   | 1.8              | 1.8 | 1956-01           |
| Wayne      | 4            | DFO                   | 1.9              | 1.9 | 1960-01           |
| Wayne      | 5            | DFO                   | 3.3              | 3.3 | 1966-01           |
| Wayne      | 6            | DFO                   | 4.9              | 4.9 | 1968-01           |
| Wayne      | 7            | DFO                   | 3.3              | 3.3 | 1998-02           |
| Wayne      | 8            | DFO                   | 3.3              | 3.3 | 1998-02           |
| Wilber     | 4            | DFO                   | 0.8              | 0.8 | 1949-01           |
| Wilber     | 5            | DFO                   | 0.6              | 0.6 | 1958-01           |
| Wilber     | 6            | DFO                   | 1.6              | 1.6 | 1996-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**New Ulm Public Utilities**

| Plant Name        | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|-------------------|--------------|-----------------------|------------------|------|-------------------|
| Municipal Station | 3            | NG                    | 4.7              | 4.7  | 1957-01           |
| Municipal Station | 4            | NG                    | 13.2             | 13.2 | 1965-01           |
| Municipal Station | 5            | DFO                   | 23.0             | 25.4 | 1975-05           |
| Municipal Station | 6            | NG                    | 4.7              | 4.7  | 1997-05           |
| Municipal Station | 7            | DFO                   | 25.0             | 27.0 | 2001-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Northwestern Public Service**

| Plant Name  | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|-------------|--------------|-----------------------|------------------|------|-------------------|
| Aberdeen CT | GT1          | DFO                   | 20.5             | 28.0 | 1978-05           |
| Clark       | 1            | DFO                   | 2.6              | 2.7  | 1970-01           |
| Faulton     | 1            | DFO                   | 2.6              | 2.7  | 1969-01           |
| Highmore    | 1            | DFO                   | 0.6              | 0.6  | 1948-01           |
| Highmore    | 2            | DFO                   | 1.3              | 1.3  | 1960-01           |
| Highmore    | 3            | DFO                   | 2.6              | 2.8  | 1970-01           |
| Huron       | 1            | NG                    | 11.1             | 14.5 | 1961-01           |
| Huron       | 2A           | NG                    | 43.7             | 49.0 | 1991-06           |
| Mobil Unit  | 1            | DFO                   | 0.5              | 0.5  | 1955-01           |
| Mobil Unit  | 2            | DFO                   | 1.8              | 1.8  | 1991-03           |
| Redfield    | 1            | NG                    | 1.3              | 1.3  | 1962-01           |
| Redfield    | 2            | NG                    | 1.3              | 1.3  | 1962-01           |
| Redfield    | 3            | NG                    | 1.3              | 1.3  | 1962-01           |
| Webster     | 1            | DFO                   | 0.8              | 0.8  | 1932-01           |
| Webster     | 2            | DFO                   | 1.9              | 1.9  | 1950-06           |
| Yankton     | 1            | NG                    | 2.2              | 2.2  | 1974-01           |
| Yankton     | 2            | DFO                   | 2.8              | 2.8  | 1974-01           |
| Yankton     | 3            | NG                    | 6.5              | 6.5  | 1975-04           |
| Yankton     | 4            | DFO                   | 2.0              | 2.0  | 1963-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

*Omaha Public Power District*

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------|--------------|-----------------------|------------------|-------|-------------------|
| Elk City        | 1            | LFG                   | 0.8              | 0.8   | 2002-04           |
| Elk City        | 2            | LFG                   | 0.8              | 0.8   | 2002-04           |
| Elk City        | 3            | LFG                   | 0.8              | 0.8   | 2002-04           |
| Elk City        | 4            | LFG                   | 0.8              | 0.8   | 2002-04           |
| Fort Calhoun    | 1            | NUC                   | 476.0            | 492.0 | 1973-09           |
| Jones Street GT | 1            | DFO                   | 59.2             | 64.7  | 1973-06           |
| Jones Street GT | 2            | DFO                   | 59.2             | 64.7  | 1973-06           |
| Nebraska City   | 1            | SUB                   | 646.0            | 652.6 | 1979-04           |
| North Omaha     | 1            | SUB                   | 78.6             | 55.8  | 1954-07           |
| North Omaha     | 2            | SUB                   | 111.0            | 95.1  | 1957-04           |
| North Omaha     | 3            | SUB                   | 111.0            | 95.1  | 1959-04           |
| North Omaha     | 4            | SUB                   | 138.2            | 115.0 | 1963-03           |
| North Omaha     | 5            | SUB                   | 224.0            | 173.4 | 1968-05           |
| Sarpy County    | 1            | DFO                   | 55.2             | 62.3  | 1972-06           |
| Sarpy County    | 2            | DFO                   | 55.2             | 62.3  | 1972-06           |
| Sarpy County    | 3            | DFO                   | 105.5            | 119.8 | 1996-05           |
| Sarpy County    | 4            | DFO                   | 47.5             | 52.5  | 2000-05           |
| Sarpy County    | 5            | DFO                   | 47.5             | 52.5  | 2000-07           |
| Sarpy County    | BSD          | DFO                   | 3.4              | 3.4   | 1996-04           |
| Tecumseh        | 1            | DFO                   | 0.6              | 0.6   | 1949-01           |
| Tecumseh        | 2            | DFO                   | 1.4              | 1.4   | 1968-01           |
| Tecumseh        | 3            | DFO                   | 1.0              | 1.0   | 1952-01           |
| Tecumseh        | 4            | DFO                   | 1.2              | 1.2   | 1960-01           |
| Tecumseh        | 5A           | DFO                   | 2.4              | 2.4   | 1993-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Otter Tail Power**

| Plant Name          | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------------|--------------|-----------------------|------------------|-------|-------------------|
| Bemidji Hydro       | 1            | WAT                   | 0.2              | 0.2   | 1907-07           |
| Bemidji Hydro       | 2            | WAT                   | 0.6              | 0.6   | 1907-05           |
| Big Stone           | 1            | SUB                   | 455.5            | 470.3 | 1975-05           |
| Big Stone           | D1           | DFO                   | 0.6              | 0.6   | 1975-05           |
| Coyote              | 1            | LIG                   | 427.0            | 427.0 | 1981-05           |
| Dakota Magic Cas    | 1            | DFO                   | 1.5              | 1.5   | 2000-01           |
| Dayton Hollow       | 1            | WAT                   | 0.5              | 0.5   | 1928-08           |
| Dayton Hollow       | 2            | WAT                   | 0.5              | 0.5   | 1909-04           |
| Fergus Control Ctr  | 1            | DFO                   | 2.0              | 2.0   | 1995-10           |
| Fleet Farm Diesel   | 1            | DFO                   | 0.8              | 0.8   | 2000-04           |
| Hendricks Wind Farm | 1            | WND                   | 0.2              | 0.3   | 2001-12           |
| Hoot Lake           | 1            | SUB                   | 8.0              | 8.0   | 1948-08           |
| Hoot Lake           | 2            | SUB                   | 62.4             | 62.4  | 1959-10           |
| Hoot Lake           | 3            | SUB                   | 84.0             | 84.0  | 1964-05           |
| Hoot Lake           | D1           | DFO                   | 0.3              | 0.3   | 1967-05           |
| Hoot Lake           | D2           | DFO                   | 0.2              | 0.2   | 1967-05           |
| Hoot Lake           | H1           | WAT                   | 0.8              | 0.8   | 1914-09           |
| Jamestown           | 1            | DFO                   | 21.6             | 28.8  | 1976-05           |
| Jamestown           | 2            | DFO                   | 20.8             | 28.5  | 1978-12           |
| Kindred School      | 1            | DFO                   | 1.9              | 1.0   | 2001-10           |
| Lake Preston        | 1A           | DFO                   | 19.8             | 26.9  | 1978-06           |
| Pisgah              | 1            | WAT                   | 0.7              | 0.7   | 1918-09           |
| Pottatch Cogen      | 1            | WDS                   | 11.9             | 11.9  | 1992-06           |
| State Auto Ins      | 1            | DFO                   | 1.5              | 1.5   | 2001-04           |
| Taplin Gorge        | 1            | WAT                   | 0.5              | 0.5   | 1925-11           |
| Valley Queen Cheese | 1            | DFO                   | 0.8              | 0.8   | 2002-04           |
| Wright              | 1            | WAT                   | 0.5              | 0.5   | 1922-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

***Pella Municipal Utilities***

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Net Capacity Win | Date of Operation |
|--------------------|--------------|-----------------------|------------------|------------------|-------------------|
| City of Pella - ST | 5            | BIT                   | 13.2             | 13.2             | 1964-01           |
| City of Pella - ST | 6            | BIT                   | 25.3             | 25.3             | 1972-01           |



**Generator Information - Existing Generators**  
MEGAWATTS

**Rochester Public Utilities**

| Plant Name        | Generator ID | Energy Source Primary | Net Capacity |      | Date of Operation |
|-------------------|--------------|-----------------------|--------------|------|-------------------|
|                   |              |                       | Sum          | W/in |                   |
| Cascade Creek     | 1            | NG                    | 27.9         | 38.0 | 1975-06           |
| Cascade Creek     | 2            | NG                    | 49.9         | 49.9 | 2002-04           |
| Lake Zumbro Hydro | 1            | WAT                   | 1.3          | 1.3  | 1984-09           |
| Lake Zumbro Hydro | 2            | WAT                   | 1.3          | 1.3  | 1984-11           |
| Silver Lake       | 1            | BIT                   | 10.4         | 10.4 | 1949-05           |
| Silver Lake       | 2            | BIT                   | 13.9         | 13.9 | 1953-05           |
| Silver Lake       | 3            | BIT                   | 24.7         | 24.7 | 1962-05           |
| Silver Lake       | 4            | BIT                   | 61.2         | 61.2 | 1969-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Southern Minnesota Municipal Power Agency**

| Plant Name       | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------------|--------------|-----------------------|------------------|-----|-------------------|
| Austin Southwest | 2            | DFO                   | 0.0              | 0.0 | 2000-05           |
| Austin Southwest | 3            | DFO                   | 0.0              | 0.0 | 2000-05           |
| Austin Southwest | 4            | DFO                   | 0.0              | 0.0 | 2000-05           |
| Austin Southwest | 5            | DFO                   | 0.0              | 0.0 | 2000-05           |
| Blooming Prairie | 1            | DFO                   | 0.3              | 0.3 | 1937-05           |
| Blooming Prairie | 2            | DFO                   | 0.7              | 0.7 | 1947-07           |
| Blooming Prairie | 3            | NG                    | 1.4              | 1.4 | 1982-01           |
| Blooming Prairie | 4            | NG                    | 1.3              | 1.3 | 1982-01           |
| Blooming Prairie | 3            | NG                    | 4.8              | 0.0 | 1992-01           |
| Fairmont         | 4            | NG                    | 4.9              | 0.0 | 1982-01           |
| Fairmont         | 5            | NG                    | 12.2             | 0.0 | 1982-01           |
| Fairmont         | 6            | NG                    | 6.5              | 6.6 | 1982-01           |
| Fairmont         | 7            | NG                    | 6.7              | 6.6 | 1982-01           |
| Grand Marais     | 2            | DFO                   | 0.6              | 0.6 | 1985-01           |
| Grand Marais     | 5            | DFO                   | 1.1              | 1.1 | 1995-01           |
| Grand Marais     | 6            | DFO                   | 1.0              | 1.0 | 1969-01           |
| Litchfield       | 5            | NG                    | 2.1              | 2.1 | 1984-09           |
| Litchfield       | 6            | NG                    | 2.1              | 2.1 | 1984-10           |
| Mora             | 2            | NG                    | 1.3              | 1.3 | 1984-10           |
| Mora             | 5            | NG                    | 5.6              | 5.6 | 1984-09           |
| Mora             | 6            | NG                    | 6.0              | 6.0 | 1984-09           |
| New Prague       | 1            | NG                    | 1.0              | 1.0 | 1948-08           |
| New Prague       | 2            | NG                    | 4.9              | 4.9 | 1982-01           |
| New Prague       | 3            | NG                    | 2.6              | 2.6 | 1982-01           |
| New Prague       | 4            | NG                    | 3.8              | 3.8 | 1982-01           |
| New Prague       | 5            | NG                    | 0.6              | 0.6 | 1944-08           |
| New Prague       | 6            | NG                    | 6.5              | 6.5 | 1982-01           |

Generator Information - Existing Generators  
MEGAWATTS

*Southern Minnesota Municipal Power Agency*

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|---------------|--------------|-----------------------|------------------|------|-------------------|
| North Branch  | 1            | NG                    | 0.8              | 0.8  | 1984-09           |
| North Branch  | 2            | NG                    | 1.2              | 1.2  | 1984-09           |
| North Branch  | 3            | NG                    | 2.0              | 2.0  | 2004-05           |
| Owatonna      | 5            | NG                    | 9.0              | 9.0  | 1957-05           |
| Owatonna      | 6            | NG                    | 21.4             | 21.4 | 1982-01           |
| Owatonna      | 7            | NG                    | 15.7             | 20.7 | 1982-01           |
| Preston       | 1            | DFO                   | 0.1              | 0.1  | 1935-08           |
| Preston       | 2            | DFO                   | 0.2              | 0.2  | 1935-08           |
| Preston       | 3            | DFO                   | 0.3              | 0.3  | 1939-08           |
| Preston       | 4            | DFO                   | 0.8              | 0.8  | 1982-01           |
| Preston       | 5            | NG                    | 1.1              | 1.1  | 1982-01           |
| Preston       | 6            | NG                    | 2.2              | 2.2  | 1982-01           |
| Princeton     | 1            | DFO                   | 0.1              | 0.1  | 1938-09           |
| Princeton     | 2            | DFO                   | 0.1              | 0.1  | 1938-09           |
| Princeton     | 3            | DFO                   | 2.3              | 2.3  | 1984-09           |
| Princeton     | 4            | DFO                   | 1.8              | 1.8  | 1984-09           |
| Princeton     | 5            | DFO                   | 1.0              | 1.0  | 1984-09           |
| Princeton     | 6            | DFO                   | 2.7              | 2.7  | 1963-09           |
| Redwood Falls | 1            | WAT                   | 0.3              | 0.3  | 1930-08           |
| Redwood Falls | 6            | NG                    | 2.2              | 2.2  | 1982-01           |
| Redwood Falls | 7            | NG                    | 6.1              | 6.1  | 1982-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Southern Minnesota Municipal Power Agency**

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|---------------|--------------|-----------------------|------------------|-----|-------------------|
| Spring Valley | 1            | NG                    | 0.8              | 0.8 | 1949-01           |
| Spring Valley | 2            | NG                    | 1.2              | 1.2 | 1952-01           |
| Spring Valley | 3            | NG                    | 2.1              | 2.1 | 1960-05           |
| Wells         | 1            | NG                    | 1.2              | 1.2 | 1982-01           |
| Wells         | 2            | NG                    | 1.2              | 1.2 | 1982-01           |
| Wells         | 3            | NG                    | 1.0              | 1.0 | 1982-01           |
| Wells         | 4            | NG                    | 1.8              | 1.8 | 1982-01           |
| Wells         | 5            | NG                    | 2.0              | 2.0 | 1982-01           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Western Area Power Administration**

| Plant Name   | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|--------------|--------------|-----------------------|------------------|------|-------------------|
| Big Bend     | 1            | WAT                   | 64.0             | 65.0 | 1964-09           |
| Big Bend     | 2            | WAT                   | 64.0             | 65.0 | 1964-09           |
| Big Bend     | 3            | WAT                   | 64.0             | 65.0 | 1965-01           |
| Big Bend     | 4            | WAT                   | 64.0             | 65.0 | 1965-04           |
| Big Bend     | 5            | WAT                   | 64.0             | 65.0 | 1965-09           |
| Big Bend     | 6            | WAT                   | 63.0             | 65.0 | 1966-01           |
| Big Bend     | 7            | WAT                   | 63.0             | 65.0 | 1966-04           |
| Big Bend     | 8            | WAT                   | 63.0             | 65.0 | 1966-06           |
| Canyon Ferry | 1            | WAT                   | 19.6             | 19.6 | 1953-12           |
| Canyon Ferry | 2            | WAT                   | 19.6             | 19.6 | 1954-01           |
| Canyon Ferry | 3            | WAT                   | 19.6             | 19.6 | 1954-03           |
| Ft Peck      | 1            | WAT                   | 48.0             | 45.0 | 1943-06           |
| Ft Peck      | 2            | WAT                   | 21.0             | 21.0 | 1948-05           |
| Ft Peck      | 3            | WAT                   | 47.0             | 47.0 | 1951-11           |
| Ft Peck      | 4            | WAT                   | 48.0             | 48.0 | 1961-05           |
| Ft Peck      | 5            | WAT                   | 48.0             | 48.0 | 1961-05           |
| Ft Randall   | 1            | WAT                   | 45.0             | 41.0 | 1954-02           |
| Ft Randall   | 2            | WAT                   | 44.0             | 41.0 | 1954-04           |
| Ft Randall   | 3            | WAT                   | 44.0             | 41.0 | 1954-09           |
| Ft Randall   | 4            | WAT                   | 44.0             | 41.0 | 1954-09           |
| Ft Randall   | 5            | WAT                   | 44.0             | 40.0 | 1955-01           |
| Ft Randall   | 6            | WAT                   | 44.0             | 40.0 | 1955-05           |
| Ft Randall   | 7            | WAT                   | 44.0             | 40.0 | 1955-10           |
| Ft Randall   | 8            | WAT                   | 44.0             | 40.0 | 1956-01           |
| Garrison     | 1            | WAT                   | 101.0            | 97.0 | 1956-01           |
| Garrison     | 2            | WAT                   | 101.0            | 96.0 | 1956-02           |
| Garrison     | 3            | WAT                   | 100.0            | 96.0 | 1956-07           |
| Garrison     | 4            | WAT                   | 100.0            | 96.0 | 1960-09           |
| Garrison     | 5            | WAT                   | 95.0             | 95.0 | 1960-05           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Western Area Power Administration**

| Plant Name   | Generator<br>ID | Energy Source<br>Primary | Net Capacity<br>Sum | Win   | Date of<br>Operation |
|--------------|-----------------|--------------------------|---------------------|-------|----------------------|
| Gavins Point | 1               | WAT                      | 34.0                | 44.1  | 1956-08              |
| Gavins Point | 2               | WAT                      | 34.0                | 44.1  | 1956-09              |
| Gavins Point | 3               | WAT                      | 34.0                | 44.1  | 1957-01              |
| Oahe         | 1               | WAT                      | 102.0               | 100.0 | 1962-03              |
| Oahe         | 2               | WAT                      | 102.0               | 100.0 | 1962-11              |
| Oahe         | 3               | WAT                      | 102.0               | 100.0 | 1962-06              |
| Oahe         | 4               | WAT                      | 102.0               | 100.0 | 1962-10              |
| Oahe         | 5               | WAT                      | 102.0               | 99.0  | 1963-02              |
| Oahe         | 6               | WAT                      | 102.0               | 99.0  | 1963-04              |
| Oahe         | 7               | WAT                      | 102.0               | 99.0  | 1963-05              |
| Yellowtail   | 3               | WAT                      | 66.0                | 66.0  | 1963-08              |
| Yellowtail   | 4               | WAT                      | 67.5                | 66.0  | 1966-08              |

**Generator Information - Existing Generators**  
MEGAWATTS

**Willmar Municipal Utilities**

| Plant Name | Generator ID | Energy Source Primary | Net Capacity Sum | Win | Date of Operation |
|------------|--------------|-----------------------|------------------|-----|-------------------|
| Willmar    | ST1          | BIT                   | 17.0             | 8.5 | 1960-04           |
| Willmar    | E04          | DFO                   | 2.0              | 2.0 | 2000-07           |
| Willmar    | E05          | DFO                   | 2.0              | 2.0 | 2000-07           |
| Willmar    | E06          | DFO                   | 2.0              | 2.0 | 2000-07           |
| Willmar    | ST1          | BIT                   | 4.0              | 4.0 | 1949-10           |
| Willmar    | ST2          | NG                    | 7.5              | 0.0 | 1956-09           |
| Willmar    | SW1          | DFO                   | 2.0              | 2.0 | 2000-07           |
| Willmar    | SW2          | DFO                   | 2.0              | 2.0 | 2000-07           |
| Willmar    | SW3          | DFO                   | 2.0              | 2.0 | 2000-07           |

**Generator Information - Existing Generators**  
MEGAWATTS

*Wisconsin Public Power, Inc.*

| Plant Name  | Generator ID | Energy Source Primary | Net Capacity Sum | Date of Operation |
|-------------|--------------|-----------------------|------------------|-------------------|
| River Falls | 1            | WAT                   | 0.2              | 1948-08           |
| River Falls | 10           | DFO                   | 3.3              | 2000-06           |
| River Falls | 5            | DFO                   | 2.7              | 1965-01           |
| River Falls | 6            | DFO                   | 2.2              | 1965-01           |
| River Falls | 7            | DFO                   | 6.3              | 1972-01           |
| River Falls | 8            | DFO                   | 0.4              | 1978-01           |
| River Falls | 9            | DFO                   | 6.4              | 1999-10           |



**Generator Information - Existing Generators**  
MEGAWATTS

**Xcel Energy**

| Plant Name          | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------------|--------------|-----------------------|------------------|-------|-------------------|
| Alliant Techsystems | 1            | DFO                   | 1.6              | 1.6   | 1994-01           |
| Angus Anson         | 1            | NG                    | 112.5            | 128.5 | 1994-08           |
| Angus Anson         | 2            | NG                    | 116.0            | 128.5 | 1994-08           |
| Apple River         | 1            | WAT                   | 0.8              | 0.8   | 1901-01           |
| Apple River         | 2            | WAT                   | 1.0              | 1.0   | 1901-01           |
| Apple River         | 3            | WAT                   | 1.1              | 1.1   | 1901-01           |
| Bay Front           | 4            | SUB                   | 22.6             | 22.6  | 1949-01           |
| Bay Front           | 5            | SUB                   | 22.6             | 24.1  | 1952-01           |
| Bay Front           | 6            | WDS                   | 29.3             | 29.8  | 1957-01           |
| Big Falls           | 1            | WAT                   | 2.5              | 2.5   | 1922-01           |
| Big Falls           | 2            | WAT                   | 2.5              | 2.5   | 1922-01           |
| Big Falls           | 3            | WAT                   | 2.5              | 2.5   | 1993-09           |
| Black Dog           | 1            | SUB                   | 71.7             | 50.0  | 1952-08           |
| Black Dog           | 2            | SUB                   | 101.0            | 77.5  | 1954-10           |
| Black Dog           | 3            | SUB                   | 111.7            | 96.6  | 1955-07           |
| Black Dog           | 4            | SUB                   | 172.5            | 172.9 | 1960-09           |
| Blue Lake           | 1            | DFO                   | 43.3             | 57.4  | 1974-03           |
| Blue Lake           | 2            | DFO                   | 42.0             | 56.1  | 1974-03           |
| Blue Lake           | 3            | DFO                   | 41.4             | 55.6  | 1974-03           |
| Blue Lake           | 4            | DFO                   | 47.4             | 62.4  | 1974-04           |
| Cedar Falls         | 1            | WAT                   | 2.3              | 2.3   | 1915-01           |
| Cedar Falls         | 2            | WAT                   | 2.2              | 2.2   | 1911-01           |
| Cedar Falls         | 3            | WAT                   | 2.3              | 2.3   | 1910-01           |
| Chippewa Falls      | 1            | WAT                   | 3.8              | 3.8   | 1928-01           |
| Chippewa Falls      | 2            | WAT                   | 3.9              | 3.9   | 1928-01           |
| Chippewa Falls      | 3            | WAT                   | 3.9              | 3.9   | 1928-01           |
| Chippewa Falls      | 4            | WAT                   | 3.8              | 3.8   | 1928-01           |
| Chippewa Falls      | 5            | WAT                   | 3.8              | 3.8   | 1928-01           |
| Chippewa Falls      | 6            | WAT                   | 3.9              | 3.9   | 1928-01           |

Generator Information - Existing Generators  
MEGAWATTS

Xcel Energy

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------|--------------|-----------------------|------------------|-------|-------------------|
| Cornell         | 1            | WAT                   | 10.0             | 10.0  | 1976-07           |
| Cornell         | 2            | WAT                   | 10.0             | 10.0  | 1976-08           |
| Cornell         | 3            | WAT                   | 10.0             | 10.0  | 1976-07           |
| Cornell         | 4            | WAT                   | 0.4              | 0.4   | 1977-04           |
| Dells           | 1            | WAT                   | 2.4              | 2.4   | 1923-01           |
| Dells           | 2            | WAT                   | 1.2              | 1.2   | 1924-01           |
| Dells           | 3            | WAT                   | 1.3              | 1.3   | 1924-01           |
| Dells           | 4            | WAT                   | 1.2              | 1.2   | 1924-01           |
| Dells           | 5            | WAT                   | 1.3              | 1.3   | 1924-01           |
| Dells           | 6            | WAT                   | 0.7              | 0.7   | 1916-01           |
| Dells           | 7            | WAT                   | 0.7              | 0.7   | 1907-01           |
| Flambeau        | 1            | NG                    | 13.6             | 19.5  | 1969-01           |
| French Island   | 1            | MSW                   | 15.0             | 15.0  | 1940-01           |
| French Island   | 2            | MSW                   | 14.0             | 15.0  | 1948-01           |
| French Island   | 3            | DFO                   | 77.2             | 96.0  | 1974-09           |
| French Island   | 4            | DFO                   | 77.2             | 96.0  | 1974-11           |
| Granite City    | 1            | NG                    | 15.0             | 18.0  | 1969-05           |
| Granite City    | 2            | NG                    | 15.0             | 18.0  | 1969-05           |
| Granite City    | 3            | NG                    | 15.0             | 18.0  | 1969-01           |
| Granite City    | 4            | NG                    | 15.0             | 18.0  | 1969-05           |
| Granite City    | 1            | WAT                   | 0.2              | 0.2   | 1925-01           |
| Hayward Hydro   | 1            | WAT                   | 2.4              | 2.4   | 1954-10           |
| Hennepin Island | 1            | WAT                   | 2.3              | 2.3   | 1955-03           |
| Hennepin Island | 2            | WAT                   | 2.3              | 2.3   | 1955-10           |
| Hennepin Island | 3            | WAT                   | 2.3              | 2.3   | 1954-10           |
| Hennepin Island | 4            | WAT                   | 2.3              | 2.3   | 1954-10           |
| Hennepin Island | 5            | WAT                   | 2.7              | 2.7   | 1955-11           |
| High Bridge     | 5            | SUB                   | 97.0             | 98.0  | 1956-08           |
| High Bridge     | 6            | SUB                   | 172.0            | 173.0 | 1959-04           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Xcel Energy**

| Plant Name       | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|------------------|--------------|-----------------------|------------------|-------|-------------------|
| Holcombe         | 1            | WAT                   | 11.8             | 11.8  | 1950-01           |
| Holcombe         | 2            | WAT                   | 11.8             | 11.8  | 1950-01           |
| Holcombe         | 3            | WAT                   | 11.8             | 11.8  | 1950-01           |
| Inver Hills      | 1            | DFO                   | 60.3             | 71.4  | 1972-04           |
| Inver Hills      | 2            | DFO                   | 58.4             | 71.4  | 1972-04           |
| Inver Hills      | 3            | DFO                   | 58.5             | 71.4  | 1972-04           |
| Inver Hills      | 4            | DFO                   | 50.4             | 65.9  | 1972-01           |
| Inver Hills      | 5            | DFO                   | 59.5             | 71.4  | 1972-04           |
| Inver Hills      | 6            | DFO                   | 61.4             | 71.4  | 1972-04           |
| Inver Hills      | 7            | DFO                   | 1.3              | 1.3   | 1997-06           |
| Inver Hills      | 8            | DFO                   | 1.3              | 1.3   | 1997-06           |
| Jim Falls        | 1            | WAT                   | 28.0             | 28.0  | 1988-08           |
| Jim Falls        | 2            | WAT                   | 28.5             | 28.5  | 1988-08           |
| Jim Falls        | 4            | WAT                   | 0.5              | 0.5   | 1988-07           |
| Key City         | 1            | NG                    | 15.5             | 19.5  | 1970-05           |
| Key City         | 2            | NG                    | 16.2             | 19.5  | 1970-05           |
| Key City         | 3            | NG                    | 16.1             | 19.5  | 1970-05           |
| Key City         | 4            | NG                    | 16.8             | 19.5  | 1970-05           |
| King             | 1            | SUB                   | 571.0            | 585.0 | 1958-03           |
| Ladysmith        | 1            | WAT                   | 1.0              | 1.0   | 1940-01           |
| Ladysmith        | 2            | WAT                   | 0.9              | 0.9   | 1940-01           |
| Ladysmith        | 3            | WAT                   | 1.2              | 1.2   | 1983-11           |
| Menomonic        | 1            | WAT                   | 2.5              | 2.5   | 1958-01           |
| Menomonic        | 2            | WAT                   | 2.6              | 2.6   | 1958-01           |
| Minnesota Valley | 3            | SUB                   | 46.0             | 47.2  | 1953-09           |
| Monticello       | 1            | NUC                   | 597.0            | 571.5 | 1971-04           |
| Pathfinder       | 1            | NG                    | 61.0             | 0.0   | 1962-01           |
| Prairie Island   | 1            | NUC                   | 525.0            | 546.0 | 1974-02           |
| Prairie Island   | 2            | NUC                   | 524.0            | 545.0 | 1997-10           |

**Generator Information - Existing Generators**  
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**Xcel Energy**

| Plant Name         | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|--------------------|--------------|-----------------------|------------------|-------|-------------------|
| Red Wing           | 1            | MSW                   | 10.8             | 11.6  | 1949-10           |
| Red Wing           | 2            | MSW                   | 10.5             | 11.3  | 1949-11           |
| Riverdale          | 1            | WAT                   | 0.3              | 0.3   | 1905-01           |
| Riverdale          | 2            | WAT                   | 0.3              | 0.3   | 1905-01           |
| Riverside          | 8            | SUB                   | 232.1            | 233.1 | 1964-04           |
| Riverside          | ST7          | SUB                   | 152.1            | 156.8 | 1987-04           |
| Saxon Falls        | 1            | WAT                   | 0.6              | 0.6   | 1913-01           |
| Saxon Falls        | 2            | WAT                   | 0.8              | 0.6   | 1913-01           |
| Sherburne Co       | 1            | SUB                   | 712.0            | 715.8 | 1976-05           |
| Sherburne Co       | 2            | SUB                   | 709.4            | 706.0 | 1977-03           |
| Sherburne Co       | 3            | SUB                   | 871.0            | 871.0 | 1987-10           |
| St Croix Falls     | 1            | WAT                   | 3.3              | 3.3   | 1917-01           |
| St Croix Falls     | 2            | WAT                   | 3.0              | 3.0   | 1917-01           |
| St Croix Falls     | 3            | WAT                   | 2.9              | 2.9   | 1917-01           |
| St Croix Falls     | 4            | WAT                   | 3.0              | 3.0   | 1917-01           |
| St Croix Falls     | 5            | WAT                   | 3.0              | 3.0   | 1910-01           |
| St Croix Falls     | 6            | WAT                   | 3.1              | 3.1   | 1910-01           |
| St Croix Falls     | 7            | WAT                   | 3.2              | 3.2   | 1923-01           |
| St Croix Falls     | 8            | WAT                   | 3.0              | 3.0   | 1923-01           |
| Superior Falls     | 1            | WAT                   | 0.9              | 0.7   | 1917-01           |
| Superior Falls     | 2            | WAT                   | 0.9              | 0.7   | 1917-01           |
| Thornapple         | 1            | WAT                   | 0.7              | 0.7   | 1927-01           |
| Thornapple         | 2            | WAT                   | 0.8              | 0.8   | 1929-01           |
| Trego              | 1            | WAT                   | 0.8              | 0.8   | 1927-01           |
| Trego              | 2            | WAT                   | 0.5              | 0.5   | 1927-01           |
| United Health Care | 1            | DFO                   | 1.8              | 1.8   | 1993-07           |
| United Health Care | 2            | DFO                   | 1.8              | 1.8   | 1993-07           |
| United Hospital    | 1            | DFO                   | 1.6              | 1.6   | 1982-10           |
| United Hospital    | 2            | DFO                   | 1.6              | 1.6   | 1992-10           |
| United Hospital    | 3            | DFO                   | 1.6              | 1.6   | 1992-10           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Xcel Energy**

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|----------------|--------------|-----------------------|------------------|------|-------------------|
| West Faribault | 2            | NG                    | 16.6             | 0.0  | 1965-05           |
| West Faribault | 3            | NG                    | 13.8             | 0.0  | 1965-05           |
| Wheaton        | 1            | DFO                   | 56.0             | 71.4 | 1973-01           |
| Wheaton        | 2            | DFO                   | 63.9             | 80.9 | 1973-04           |
| Wheaton        | 3            | DFO                   | 57.0             | 71.4 | 1973-04           |
| Wheaton        | 4            | DFO                   | 55.8             | 71.4 | 1973-04           |
| Wheaton        | 5            | DFO                   | 57.9             | 76.9 | 1973-06           |
| Wheaton        | 6            | DFO                   | 54.5             | 79.2 | 1973-06           |
| White River    | 1            | WAT                   | 0.4              | 0.3  | 1907-01           |
| White River    | 2            | WAT                   | 0.4              | 0.3  | 1907-01           |
| Wilmarth       | 1            | MSW                   | 10.1             | 10.6 | 1948-09           |
| Wilmarth       | 2            | MSW                   | 10.8             | 11.4 | 1951-03           |
| Wissota        | 1            | WAT                   | 6.2              | 6.2  | 1917-01           |
| Wissota        | 2            | WAT                   | 6.2              | 6.2  | 1917-01           |
| Wissota        | 3            | WAT                   | 6.2              | 6.2  | 1917-01           |
| Wissota        | 4            | WAT                   | 6.2              | 6.2  | 1917-01           |
| Wissota        | 5            | WAT                   | 6.0              | 6.0  | 1917-01           |
| Wissota        | 6            | WAT                   | 6.2              | 6.2  | 1917-01           |

Generator Information - Existing Generators  
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*Manitoba Hydro Electric Board*

| Plant Name   | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|--------------|--------------|-----------------------|------------------|-------|-------------------|
| Brandon      | 5            | SUB                   | 90.3             | 93.9  | 1970-09           |
| Brandon      | 6            | NG                    | 118.1            | 0.0   | 2002-05           |
| Brandon      | 7            | NG                    | 119.4            | 0.0   | 2002-06           |
| Great Falls  | 1            | WAT                   | 22.7             | 22.9  | 1923-01           |
| Great Falls  | 2            | WAT                   | 21.0             | 21.2  | 1923-03           |
| Great Falls  | 3            | WAT                   | 21.4             | 21.6  | 1926-10           |
| Great Falls  | 4            | WAT                   | 19.8             | 20.0  | 1927-10           |
| Great Falls  | 5            | WAT                   | 21.6             | 21.8  | 1928-07           |
| Great Falls  | 6            | WAT                   | 21.4             | 21.6  | 1928-10           |
| Grand Rapids | 1            | WAT                   | 117.7            | 111.8 | 1965-09           |
| Grand Rapids | 2            | WAT                   | 117.7            | 111.8 | 1965-08           |
| Grand Rapids | 3            | WAT                   | 117.7            | 111.8 | 1965-08           |
| Grand Rapids | 4            | WAT                   | 124.8            | 118.5 | 1968-10           |
| Jenpeg       | 1            | WAT                   | 16.9             | 16.1  | 1979-10           |
| Jenpeg       | 2            | WAT                   | 16.9             | 16.1  | 1979-02           |
| Jenpeg       | 3            | WAT                   | 16.9             | 16.1  | 1978-11           |
| Jenpeg       | 4            | WAT                   | 16.9             | 16.1  | 1978-08           |
| Jenpeg       | 5            | WAT                   | 16.9             | 16.1  | 1978-03           |
| Jenpeg       | 6            | WAT                   | 16.9             | 16.1  | 1977-05           |
| Kelsey       | 1            | WAT                   | 31.8             | 30.4  | 1960-05           |
| Kelsey       | 2            | WAT                   | 31.6             | 30.1  | 1960-05           |
| Kelsey       | 3            | WAT                   | 31.1             | 29.6  | 1960-07           |
| Kelsey       | 4            | WAT                   | 32.0             | 30.5  | 1960-09           |
| Kelsey       | 5            | WAT                   | 31.7             | 30.2  | 1961-01           |
| Kelsey       | 6            | WAT                   | 32.2             | 30.7  | 1969-05           |
| Kelsey       | 7            | WAT                   | 30.7             | 29.3  | 1972-09           |
| Kettle       | 1            | WAT                   | 102.3            | 101.6 | 1970-11           |
| Kettle       | 10           | WAT                   | 100.3            | 99.7  | 1974-04           |
| Kettle       | 11           | WAT                   | 101.7            | 101.1 | 1974-08           |
| Kettle       | 12           | WAT                   | 101.1            | 100.5 | 1974-10           |

**Generator Information - Existing Generators**  
MEGAWATTS

**Manitoba Hydro Electric Board**

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|----------------|--------------|-----------------------|------------------|-------|-------------------|
| Kettle         | 2            | WAT                   | 103.1            | 102.4 | 1971-02           |
| Kettle         | 3            | WAT                   | 102.5            | 101.8 | 1971-03           |
| Kettle         | 4            | WAT                   | 101.7            | 101.0 | 1971-04           |
| Kettle         | 5            | WAT                   | 102.7            | 102.0 | 1972-01           |
| Kettle         | 6            | WAT                   | 102.1            | 101.4 | 1972-05           |
| Kettle         | 7            | WAT                   | 102.1            | 101.4 | 1973-01           |
| Kettle         | 8            | WAT                   | 102.1            | 101.4 | 1973-08           |
| Kettle         | 9            | WAT                   | 101.5            | 100.8 | 1973-11           |
| Limestone      | 1            | WAT                   | 136.3            | 136.2 | 1990-08           |
| Limestone      | 10           | WAT                   | 136.3            | 136.2 | 1992-08           |
| Limestone      | 2            | WAT                   | 133.6            | 133.5 | 1990-09           |
| Limestone      | 3            | WAT                   | 135.7            | 135.6 | 1990-11           |
| Limestone      | 4            | WAT                   | 134.6            | 134.5 | 1991-02           |
| Limestone      | 5            | WAT                   | 131.8            | 131.7 | 1991-05           |
| Limestone      | 6            | WAT                   | 135.3            | 135.2 | 1991-08           |
| Limestone      | 7            | WAT                   | 135.9            | 135.8 | 1991-11           |
| Limestone      | 8            | WAT                   | 135.1            | 135.1 | 1992-02           |
| Limestone      | 9            | WAT                   | 133.4            | 133.3 | 1992-05           |
| Long Spruce    | 1            | WAT                   | 101.4            | 100.0 | 1977-09           |
| Long Spruce    | 10           | WAT                   | 100.2            | 98.8  | 1979-07           |
| Long Spruce    | 2            | WAT                   | 101.0            | 99.6  | 1977-11           |
| Long Spruce    | 3            | WAT                   | 101.2            | 99.8  | 1978-03           |
| Long Spruce    | 4            | WAT                   | 101.0            | 99.6  | 1978-07           |
| Long Spruce    | 5            | WAT                   | 102.2            | 100.8 | 1978-09           |
| Long Spruce    | 6            | WAT                   | 100.4            | 99.0  | 1978-11           |
| Long Spruce    | 7            | WAT                   | 100.2            | 98.8  | 1979-03           |
| Long Spruce    | 8            | WAT                   | 102.0            | 100.6 | 1979-04           |
| Long Spruce    | 9            | WAT                   | 100.4            | 99.0  | 1979-06           |
| Laurie River I | 1            | WAT                   | 2.5              | 2.5   | 1952-08           |
| Laurie River I | 2            | WAT                   | 2.6              | 2.6   | 1952-08           |

Generator Information - Existing Generators  
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*Manitoba Hydro Electric Board*

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|-----------------|--------------|-----------------------|------------------|------|-------------------|
| Laurie River II | 1            | WAT                   | 5.4              | 5.5  | 1958-01           |
| Mcarthur        | 1            | WAT                   | 6.8              | 6.7  | 1954-10           |
| Mcarthur        | 2            | WAT                   | 6.7              | 6.7  | 1954-11           |
| Mcarthur        | 3            | WAT                   | 6.8              | 6.7  | 1954-11           |
| Mcarthur        | 4            | WAT                   | 6.8              | 6.7  | 1954-11           |
| Mcarthur        | 5            | WAT                   | 7.0              | 7.0  | 1955-01           |
| Mcarthur        | 6            | WAT                   | 6.6              | 6.5  | 1955-03           |
| Mcarthur        | 7            | WAT                   | 7.0              | 7.0  | 1955-03           |
| Mcarthur        | 8            | WAT                   | 7.0              | 6.9  | 1955-03           |
| Point Du Bois   | 1            | WAT                   | 9.0              | 9.0  | 2000-10           |
| Point Du Bois   | 10           | WAT                   | 4.5              | 4.4  | 1922-01           |
| Point Du Bois   | 11           | WAT                   | 4.7              | 4.7  | 1922-09           |
| Point Du Bois   | 12           | WAT                   | 5.1              | 5.0  | 1925-05           |
| Point Du Bois   | 13           | WAT                   | 5.1              | 5.1  | 1925-09           |
| Point Du Bois   | 14           | WAT                   | 5.1              | 5.1  | 1926-01           |
| Point Du Bois   | 15           | WAT                   | 5.6              | 5.5  | 1926-09           |
| Point Du Bois   | 16           | WAT                   | 5.6              | 5.5  | 1926-10           |
| Point Du Bois   | 2            | WAT                   | 3.7              | 3.6  | 1911-09           |
| Point Du Bois   | 3            | WAT                   | 3.7              | 3.6  | 1911-09           |
| Point Du Bois   | 4            | WAT                   | 3.7              | 3.6  | 1911-09           |
| Point Du Bois   | 5            | WAT                   | 4.5              | 4.4  | 1914-09           |
| Point Du Bois   | 6            | WAT                   | 4.5              | 4.4  | 1914-11           |
| Point Du Bois   | 7            | WAT                   | 3.3              | 3.3  | 1911-09           |
| Point Du Bois   | 8            | WAT                   | 4.0              | 3.9  | 1919-02           |
| Point Du Bois   | 9            | WAT                   | 4.5              | 4.4  | 1921-11           |
| Pine Falls      | 1            | WAT                   | 13.5             | 13.7 | 1952-10           |
| Pine Falls      | 2            | WAT                   | 13.5             | 13.7 | 1952-05           |
| Pine Falls      | 3            | WAT                   | 13.4             | 13.6 | 1952-04           |
| Pine Falls      | 4            | WAT                   | 13.1             | 13.3 | 1952-04           |
| Pine Falls      | 5            | WAT                   | 15.8             | 16.0 | 1951-11           |



**Generator Information - Existing Generators**  
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**Manitoba Hydro Electric Board**

| Plant Name    | Generator ID | Energy Source Primary | Net Capacity Sum | Win  | Date of Operation |
|---------------|--------------|-----------------------|------------------|------|-------------------|
| Pine Falls    | 6            | WAT                   | 16.1             | 16.3 | 1951-11           |
| Slave Falls   | 1            | WAT                   | 7.6              | 8.0  | 1931-08           |
| Slave Falls   | 2            | WAT                   | 7.1              | 7.4  | 1931-08           |
| Slave Falls   | 3            | WAT                   | 7.6              | 8.0  | 1937-06           |
| Slave Falls   | 4            | WAT                   | 7.6              | 8.0  | 1938-09           |
| Slave Falls   | 5            | WAT                   | 7.7              | 8.1  | 1947-07           |
| Slave Falls   | 6            | WAT                   | 7.7              | 8.1  | 1946-09           |
| Slave Falls   | 7            | WAT                   | 7.6              | 8.0  | 1948-01           |
| Slave Falls   | 8            | WAT                   | 7.6              | 8.0  | 1948-10           |
| Selkirk       | 1            | LIG                   | 62.7             | 0.0  | 1960-09           |
| Selkirk       | 2            | LIG                   | 55.2             | 0.0  | 1961-01           |
| Seven Sisters | 1            | WAT                   | 29.1             | 27.3 | 1931-05           |
| Seven Sisters | 2            | WAT                   | 28.2             | 26.4 | 1931-07           |
| Seven Sisters | 3            | WAT                   | 27.3             | 25.6 | 1931-06           |
| Seven Sisters | 4            | WAT                   | 28.2             | 26.4 | 1949-11           |
| Seven Sisters | 5            | WAT                   | 25.7             | 24.1 | 1950-07           |
| Seven Sisters | 6            | WAT                   | 25.7             | 24.1 | 1952-08           |

**Generator Information - Existing Generators**  
MEGAWATTS

**SaskPower**

| Plant Name                | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|---------------------------|--------------|-----------------------|------------------|-------|-------------------|
| Boundary Dam              | 1            | LIG                   | 62.0             | 62.0  | 1959-01           |
| Boundary Dam              | 2            | LIG                   | 61.0             | 61.0  | 1960-01           |
| Boundary Dam              | 3            | LIG                   | 139.0            | 139.0 | 1969-01           |
| Boundary Dam              | 4            | LIG                   | 139.0            | 139.0 | 1970-01           |
| Boundary Dam              | 5            | LIG                   | 139.0            | 139.0 | 1973-07           |
| Boundary Dam              | 6            | LIG                   | 272.5            | 272.5 | 1977-11           |
| Charlot River             | 1            | WAT                   | 5.1              | 5.1   | 1980-01           |
| Charlot River             | 2            | WAT                   | 5.1              | 5.1   | 1980-01           |
| Coteau Creek              | 1            | WAT                   | 62.5             | 62.5  | 1968-08           |
| Coteau Creek              | 2            | WAT                   | 62.5             | 62.5  | 1968-10           |
| Coteau Creek              | 3            | WAT                   | 62.5             | 62.5  | 1968-11           |
| Cypress Windpower Project | 1            | WND                   | 5.9              | 5.9   | 2002-10           |
| E B Campbell              | 1            | WAT                   | 33.8             | 33.6  | 1963-01           |
| E B Campbell              | 2            | WAT                   | 33.8             | 33.6  | 1963-01           |
| E B Campbell              | 3            | WAT                   | 33.8             | 33.6  | 1963-01           |
| E B Campbell              | 4            | WAT                   | 33.8             | 33.6  | 1963-01           |
| E B Campbell              | 5            | WAT                   | 33.8             | 33.6  | 1964-01           |
| E B Campbell              | 6            | WAT                   | 33.8             | 33.6  | 1964-01           |
| E B Campbell              | 7            | WAT                   | 42.0             | 42.0  | 1966-01           |
| E B Campbell              | 8            | WAT                   | 42.0             | 42.0  | 1967-01           |
| Island Falls              | 1            | WAT                   | 14.0             | 14.0  | 1930-01           |
| Island Falls              | 2            | WAT                   | 14.0             | 14.0  | 1930-01           |
| Island Falls              | 3            | WAT                   | 14.0             | 14.0  | 1930-01           |
| Island Falls              | 4            | WAT                   | 14.0             | 14.0  | 1937-01           |
| Island Falls              | 5            | WAT                   | 15.0             | 15.0  | 1939-01           |
| Island Falls              | 6            | WAT                   | 15.0             | 15.0  | 1948-01           |
| Island Falls              | 7            | WAT                   | 15.0             | 15.0  | 1959-01           |
| Landis                    | 1            | NG                    | 66.4             | 78.8  | 1975-01           |
| Meadow Lake               | 1            | NG                    | 38.2             | 43.9  | 1984-11           |

**Generator Information - Existing Generators**  
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**SaskPower**

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Date of Operation |
|-----------------|--------------|-----------------------|------------------|-------|-------------------|
| Meridian        | 1            | NG                    | 75.5             | 86.5  | 1999-12           |
| Meridian        | 2            | NG                    | 75.5             | 86.5  | 1999-12           |
| Meridian        | 3            | NG                    | 55.0             | 55.0  | 1999-12           |
| Nipawin         | 1            | WAT                   | 85.0             | 85.0  | 1985-10           |
| Nipawin         | 2            | WAT                   | 85.0             | 85.0  | 1985-11           |
| Nipawin         | 3            | WAT                   | 85.0             | 85.0  | 1986-02           |
| Poplar River    | 1            | LIG                   | 281.0            | 281.0 | 1983-06           |
| Poplar River    | 2            | LIG                   | 281.0            | 281.0 | 1981-01           |
| Queen Elizabeth | 1            | NG                    | 62.0             | 62.0  | 1958-01           |
| Queen Elizabeth | 2            | NG                    | 63.0             | 63.0  | 1959-01           |
| Queen Elizabeth | 3            | NG                    | 95.0             | 95.0  | 1972-10           |
| Queen Elizabeth | 4            | NG                    | 24.2             | 27.9  | 2002-02           |
| Queen Elizabeth | 5            | NG                    | 24.2             | 27.9  | 2002-02           |
| Queen Elizabeth | 6            | NG                    | 24.2             | 27.9  | 2002-02           |
| Queen Elizabeth | 7            | NG                    | 24.2             | 27.9  | 2002-05           |
| Queen Elizabeth | 8            | NG                    | 24.2             | 27.9  | 2002-04           |
| Queen Elizabeth | 9            | NG                    | 24.2             | 27.9  | 2002-03           |
| Queen Elizabeth | 1            | LIG                   | 278.8            | 278.8 | 1992-06           |
| Shand           | 1            | NG                    | 8.0              | 10.0  | 1967-01           |
| Success         | 1            | NG                    | 8.0              | 10.0  | 1967-01           |
| Success         | 2            | NG                    | 8.0              | 10.0  | 1967-01           |
| Success         | 3            | NG                    | 8.0              | 10.0  | 1968-07           |
| Sunbridge       | 1            | WND                   | 11.2             | 11.2  | 2001-08           |
| Waterloo        | 1            | WAT                   | 8.0              | 8.0   | 1961-01           |
| Wellington      | 1            | WAT                   | 2.4              | 2.4   | 1939-01           |
| Wellington      | 2            | WAT                   | 2.4              | 2.4   | 1959-01           |
| NA1             | 1            | OG                    | 0.1              | 0.1   |                   |
| NA2             | 1            | OG                    | 0.1              | 0.1   |                   |
| NA3             | 1            | OG                    | 0.1              | 0.1   |                   |

**Generator Information - Planned Generators**  
MEGAWATTS

| Company Name                             | Plant Name           | Generator ID | Prime Mover | Energy Source Primary | Net Capacity Sum | Win   | Current Eff. Date | Status Code |
|------------------------------------------|----------------------|--------------|-------------|-----------------------|------------------|-------|-------------------|-------------|
| Ames Municipal Electric System           | Ames GT              | GT2          |             | DFO                   | 20               | 20    | 2005-05           | P           |
| Blooming Prairie Public Util Comm        | Blooming Prairie     | 5            |             | DFO                   | 2                | 2     | 2003-06           | P           |
| Central Minnesota Municipal Power Agency | Glencoe Landfill Gas | LF1          | GT          | LFG                   | 3.2              | 3.2   | 2004-01           | P           |
| Com Belt Power                           | Wisdom GT            | NA1          |             | NG                    | 74.6             | 86    | 2004-06           | P           |
| Dairyland Power Cooperative              | Lake Mills LFG       | 1            | IC          | LFG                   | 6                | 6     | 2003-09           | P           |
| Dairyland Power Cooperative              | Seven Mile Creek LFG | 1            | IC          | LFG                   | 3                | 3     | 2003-09           | P           |
| Dairyland Power Cooperative              | NA 1                 | 7            | ST          | SUB                   | 300              | 300   | 2009-06           | P           |
| Dairyland Power Cooperative              | Argyle               | 4            | IC          | DFO                   | 2.25             | 2.25  | 2004-07           | L           |
| Dairyland Power Cooperative              | Elroy                | 6            | IC          | DFO                   | 2                | 2     | 2004-09           | L           |
| Dairyland Power Cooperative              | Elroy                | 7            | IC          | DFO                   | 2                | 2     | 2004-09           | L           |
| Dairyland Power Cooperative              | Lanesboro            | 4            | IC          | DFO                   | 2                | 2     | 2004-10           | P           |
| Dairyland Power Cooperative              | New Lisbon           | 6            | IC          | DFO                   | 2                | 2     | 2005-06           | P           |
| Dairyland Power Cooperative              | New Lisbon           | 7            | IC          | DFO                   | 2                | 2     | 2005-06           | P           |
| Dairyland Power Cooperative              | Argyle               | 2            | IC          | DFO                   | 1.014            | 1.014 | 2004-07           | RT          |
| Dairyland Power Cooperative              | Argyle               | 3            | IC          | DFO                   | 1.079            | 1.079 | 2004-07           | RT          |
| Grand Island, City of                    | Burdick              | GT-2         | GT          | NG                    | 40               | 40    | 2003-04           | TS          |
| Grand Island, City of                    | Burdick              | GT-3         | GT          | NG                    | 40               | 40    | 2003-04           | TS          |
| Grand Marais City of                     | Grand Marais         | 2            |             | DFO                   | 0.6              | 0.6   | 2003-12           | RT          |
| Grand Marais City of                     | Grand Marais         | 5            |             | DFO                   | 1.1              | 1.1   | 2003-12           | RT          |
| Grand Marais City of                     | Grand Marais         | 6            |             | DFO                   | 1                | 1     | 2003-12           | RT          |
| Grand Marais City of                     | Grand Marais         | 7            |             | DFO                   | 2                | 2     | 2004-06           | P           |
| Grand Marais City of                     | Grand Marais         | 8            |             | DFO                   | 2                | 2     | 2004-06           | P           |
| Grand Marais City of                     | Grand Marais         | 9            |             | DFO                   | 2                | 2     | 2004-06           | P           |
| Great River Energy                       | NA                   | NA           | CC          | NG                    | 400              | 500   | 2007-05           | P           |
| Harlan Municipal Utilities               | Harlan               | 3            |             | DFO                   | 2                | 2     | 2005-06           | P           |
| Hastings Utilities (NE)                  | Whelen Energy Center | 2            | ST          | SUB                   | 25               | 25    |                   | P           |
| Lincoln Electric System                  | Salt Valley          | 1            | CA          | WH                    | 27               | 27    | 2004-01           | U           |
| Lincoln Electric System                  | Salt Valley          | 2            | GT          | NG                    | 37               | 37    | 2003-06           | V           |
| Lincoln Electric System                  | Salt Valley          | 3            | GT          | NG                    | 37               | 37    | 2003-06           | V           |
| Lincoln Electric System                  | Salt Valley          | 4            | GT          | NG                    | 37               | 37    | 2003-07           | V           |
| Lincoln Electric System                  | Salt Valley          | BSU          | IC          | DFO                   | 2                | 2     | 2003-06           | V           |
| Lincoln Electric System                  | Salt Valley          | 2            | CT          | NG                    | 9                | 9     | 2004-01           | A           |
| Lincoln Electric System                  | Salt Valley          | 3            | CT          | NG                    | 9                | 9     | 2004-01           | A           |
| Lincoln Electric System                  | Salt Valley          | 4            | GT          | NG                    | 9                | 9     | 2004-01           | A           |

**Generator Information - Planned Generators**  
MEGAWATTS

| Company Name                     | Plant Name                     | Generator ID | Prime Mover | Energy Source Primary | Net Capacity Sum | Win  | Current Eff. Date | Status Code |
|----------------------------------|--------------------------------|--------------|-------------|-----------------------|------------------|------|-------------------|-------------|
| MidAmerican Energy Company       | Greater Des Moines Energy Cent | GT1          |             | NG                    | 155              | 205  | 2003-06           | V           |
| MidAmerican Energy Company       | Greater Des Moines Energy Cent | GT2          |             | NG                    | 155              | 205  | 2003-06           | V           |
| MidAmerican Energy Company       | Greater Des Moines Energy Cent | ST1          |             | NG                    | 190              | 195  | 2005-03           | U           |
| MidAmerican Energy Company       | Council Bluffs Energy Center   | 4            |             | SUB                   | 750              | 750  | 2007-06           | P           |
| Minnkota Power Cooperative, Inc. | Reed                           | 1            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Reed                           | 2            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Reed                           | 3            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Reed                           | 4            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Reed                           | 5            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Reed                           | 6            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Oxbow                          | 1            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Oxbow                          | 2            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Arthur                         | 1            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Minnkota Power Cooperative, Inc. | Arthur                         | 2            | IC          | DFO                   | 2                | 2    | 2003-05           | V           |
| Missouri River Energy Services   | Exira Station                  | 1            | GT          | NG                    | 47.5             | 47.5 | 2004-05           | P           |
| Missouri River Energy Services   | Exira Station                  | 2            | GT          | NG                    | 47.5             | 47.5 | 2004-05           | P           |
| Montana-Dakota Utilities Co.     | Glendive CT                    | 2            | GT          | NG                    | 39               | 42   | 2003-06           | U           |
| Nebraska Public Power District   | Proposed New Plant 1           | 1            | WT          | WND                   | 10               | 10   | 2004-10           | P           |
| Nebraska Public Power District   | Proposed New Plant 2           | 1            | CC          | NG                    | 217              | 217  | 2005-01           | L           |
| Nebraska Public Power District   | Mullen                         | 1            |             | DFO                   | 0.35             | 0.35 | 2005-10           | OT          |
| Nebraska Public Power District   | Mullen                         | 2            |             | DFO                   | 0.65             | 0.65 | 2005-10           | OT          |
| Nebraska Public Power District   | Spalding                       | 1            |             | DFO                   | 0                | 0    | 2006-01           | OT          |
| Nebraska Public Power District   | Spalding                       | 2            |             | DFO                   | 0.4              | 0.4  | 2006-01           | OT          |
| Nebraska Public Power District   | Spalding                       | 3            |             | DFO                   | 1.4              | 1.4  | 2006-01           | OT          |
| Nebraska Public Power District   | Spalding                       | 4            |             | DFO                   | 0.2              | 0.2  | 2006-01           | OT          |
| Nebraska Public Power District   | Spalding                       | 5            |             | DFO                   | 0.25             | 0.25 | 2006-01           | OT          |
| Nebraska Public Power District   | Wilber                         | 4            |             | DFO                   | 0.78             | 0.78 | 2006-01           | OT          |
| Nebraska Public Power District   | Wilber                         | 5            |             | DFO                   | 0.59             | 0.59 | 2006-01           | OT          |
| Nebraska Public Power District   | Wilber                         | 6            |             | DFO                   | 1.57             | 1.57 | 2006-01           | OT          |
| Nebraska Public Power District   | Belleville, KS                 | 4            |             | NG                    | 0.8              | 0.8  | 2012-06           | OT          |
| Nebraska Public Power District   | Belleville, KS                 | 6            |             | NG                    | 3.1              | 3.1  | 2012-05           | OT          |
| Nebraska Public Power District   | Belleville, KS                 | 7            |             | NG                    | 4.1              | 4.1  | 2012-05           | OT          |
| Nebraska Public Power District   | Proposed New Plant 2           | 1            |             | NG                    | 229              | 229  | 2006-01           | A           |
| North Branch Public Utilities    | North Branch                   | 3            |             | DFO                   | 2                | 2    | 2003-06           | P           |
| North Branch Public Utilities    | North Branch                   | 4            |             | DFO                   | 2                | 2    | 2003-06           | P           |

**Generator Information - Planned Generators**  
MEGAWATTS

| Company Name                               | Plant Name             | Generator | Prime | Energy Source | Net Capacity |      | Current   | Status |
|--------------------------------------------|------------------------|-----------|-------|---------------|--------------|------|-----------|--------|
|                                            |                        | ID        | Mover | Primary       | Sum          | Win  | Eff. Date | Code   |
| Northwestern Public Service Company        | Webster                | 1         |       | DFO           | 0.8          | 0.8  | 2002-03   | RA     |
| Omaha Public Power District                | Cass County            | 1         | GT    | NG            | 159.5        | 190  | 2003-06   | V      |
| Omaha Public Power District                | Cass County            | 2         | GT    | NG            | 159.5        | 190  | 2003-06   | V      |
| Omaha Public Power District                | Elk City               | 5         | IC    | LFG           | 0.75         | 0.75 | 2005-01   | P      |
| Omaha Public Power District                | Elk City               | 6         | IC    | LFG           | 0.75         | 0.75 | 2005-01   | P      |
| Omaha Public Power District                | Elk City               | 7         | IC    | LFG           | 0.75         | 0.75 | 2007-01   | P      |
| Omaha Public Power District                | Elk City               | 8         | IC    | LFG           | 0.75         | 0.75 | 2007-01   | P      |
| Omaha Public Power District                | Nebraska City          | 2         | ST    | SUB           | 600          | 600  | 2009-05   | P      |
| Omaha Public Power District                | Fort Calhoun           | 1         |       | NJC           | 600          | 600  | 2003-11   | A      |
| Otter Tail Power Company                   | New CT (Solway)        | 1         |       | NG            | 43           | 47   | 2003-05   | V      |
| Otter Tail Power Company                   | New CT Diesel (Solway) | D1        |       | DFO           | 1.25         | 1.25 | 2003-05   | V      |
| Otter Tail Power Company                   | Perham Incinerator     | 1         |       | MSW           | 2.5          | 2.5  | 2003-05   | TS     |
| Pella Municipal Power And Light Department | City of Pella - IC     | 10        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 11        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 12        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 13        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 14        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 15        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 16        |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 3         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 4         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 5         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 6         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 7         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 8         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Pella Municipal Power And Light Department | City of Pella - IC     | 9         |       | DFO           | 2            | 2    | 2003-05   | L      |
| Princeton Public Utili Comm                | Princeton              | 7         |       | DFO           | 5            | 5    | 2003-06   | P      |
| Redwood Falls Public Utili Comm            | Redwood Falls          | 2         |       | DFO           | 2            | 2    | 2003-05   | P      |
| Redwood Falls Public Utili Comm            | Redwood Falls          | 3         |       | DFO           | 2            | 2    | 2003-05   | P      |
| Redwood Falls Public Utili Comm            | Redwood Falls          | 4         |       | DFO           | 2            | 2    | 2003-05   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 1         |       | DFO           | 2            | 2    | 2003-06   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 2         |       | DFO           | 2            | 2    | 2003-06   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 3         |       | DFO           | 2            | 2    | 2003-06   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 4         |       | DFO           | 2            | 2    | 2003-06   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 5         |       | DFO           | 2            | 2    | 2003-06   | P      |
| Saint Peter Public Utili Comm              | Saint Peter            | 6         |       | DFO           | 2            | 2    | 2003-06   | P      |

Generator Information - Planned Generators  
MEGAWATTS

| Company Name                   | Plant Name | Generator ID | Prime Mover | Energy Source Primary | Net Capacity Sum | Win  | Current Eff. Date | Status Code |
|--------------------------------|------------|--------------|-------------|-----------------------|------------------|------|-------------------|-------------|
| Saskatchewan Power Corporation | Cory       | 1            |             | NG                    | 81.7             | 95.1 | 2003-01           | TS          |
| Saskatchewan Power Corporation | Cory       | 2            |             | NG                    | 81.7             | 95.1 | 2003-01           | TS          |
| Saskatchewan Power Corporation | Cory       | 3            |             | NG                    | 68.2             | 72.6 | 2003-01           | TS          |

Generator Information - Joint Owned Units  
MEGAWATTS

| Plant Name     | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Owning Company | Percent Owned |
|----------------|--------------|-----------------------|------------------|-------|----------------|---------------|
| Laramie River  | 1            | SUB                   | 550.0            | 550.0 | MRES           | 49.55         |
|                |              |                       |                  |       | LES            | 31.54         |
|                |              |                       |                  |       | HCPD           | 9.03          |
|                |              |                       |                  |       | BEPC           | 8.14          |
|                |              |                       |                  |       | MEAN           | 1.74          |
| Duane Arnold   | 1            | NUC                   | 520.0            | 535.0 | IESC           | 90            |
|                |              |                       |                  |       | CBPC           | 10            |
| Council Bluffs | 3            | SUB                   | 690              | 690   | MEC            | 79.1          |
|                |              |                       |                  |       | CIPCO          | 11.5          |
|                |              |                       |                  |       | CBPC           | 3.8           |
|                |              |                       |                  |       | CFU            | 3.1           |
|                |              |                       |                  |       | ATL            | 2.5           |
| Neal North     | 3            | SUB                   | 515              | 515   | MEC            | 72            |
|                |              |                       |                  |       | IESC           | 28            |
| Ottumwa        | 1            | SUB                   | 738.1            | 738.1 | MEC            | 52            |
|                |              |                       |                  |       | IESC           | 48            |
| Louisa         | 1            | SUB                   | 700.0            | 700.0 | MEC            | 88            |
|                |              |                       |                  |       | CIPCO          | 4.6           |
|                |              |                       |                  |       | IPW            | 4             |
|                |              |                       |                  |       | Waverly        | 1.1           |
|                |              |                       |                  |       | HRLN           | 0.8           |
|                |              |                       |                  |       | Eldridge       | 0.5           |
|                |              |                       |                  |       | Tipton         | 0.5           |
|                |              |                       |                  |       | Genesee        | 0.5           |



Generator Information - Joint Owned Units  
MEGAWATTS

| Plant Name      | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Owning Company | Percent Owned |
|-----------------|--------------|-----------------------|------------------|-------|----------------|---------------|
| Neal South      | 4            | SUB                   | 624.0            | 624.0 | MEC            | 40.57         |
|                 |              |                       |                  |       | IPW            | 21.53         |
|                 |              |                       |                  |       | CBPC           | 9.03          |
|                 |              |                       |                  |       | NIPCO          | 9.03          |
|                 |              |                       |                  |       | NWPS           | 8.68          |
|                 |              |                       |                  |       | ALGN           | 2.94          |
|                 |              |                       |                  |       | Webster        | 2.6           |
|                 |              |                       |                  |       | CFU            | 2.5           |
|                 |              |                       |                  |       | Spencer        | 1.22          |
|                 |              |                       |                  |       | Coon Rapids    | 0.52          |
|                 |              |                       |                  |       | Laurens        | 0.52          |
|                 |              |                       |                  |       | Barcroft       | 0.35          |
|                 |              |                       |                  |       | Milford        | 0.35          |
|                 |              |                       |                  |       | Graettinger    | 0.17          |
| Clay Boswell    | 4            | SUB                   | 424.4            | 424.4 | MP             | 79.9          |
|                 |              |                       |                  |       | WPPI           | 20.1          |
| Clay Boswell    | D4           | DFO                   | 0.7              | 0.7   | MP             | 80            |
|                 |              |                       |                  |       | WPPI           | 20            |
| Milton R Young  | 2            | LIG                   | 455.0            | 447.0 | MP             | 70.85         |
|                 |              |                       |                  |       | MPC            | 29.15         |
| Big Stone       | 1            | SUB                   | 455.5            | 470.3 | OTP            | 53.88         |
|                 |              |                       |                  |       | NWPS           | 23.43         |
|                 |              |                       |                  |       | MDU            | 22.69         |
| Big Stone       | D1           | DFO                   | 0.6              | 0.6   | OTP            | 57.2          |
|                 |              |                       |                  |       | MDU            | 21.53         |
|                 |              |                       |                  |       | NWPS           | 21.27         |
| Pottlatch Cogen | 1            | WDS                   | 11.9             | 11.9  | OTP            | 50            |
|                 |              |                       |                  |       | MPC            | 50            |

Generator Information - Joint Owned Units  
MEGAWATTS

| Plant Name       | Generator ID | Energy Source Primary | Net Capacity Sum | Win   | Owning Company | Percent Owned |
|------------------|--------------|-----------------------|------------------|-------|----------------|---------------|
| Coyote           | 1            | LIG                   | 427.0            | 427.0 | OTP            | 35            |
|                  |              |                       |                  |       | MPC            | 30            |
|                  |              |                       |                  |       | MDU            | 25            |
|                  |              |                       |                  |       | NWPS           | 10            |
| Sherburne County | 3            | SUB                   | 871.0            | 871.0 | NSP            | 59            |
|                  |              |                       |                  |       | SMPA           | 41            |

# **FORECAST OF SYSTEM DEMAND**

Section V

**Forecast of System Demand for MAPP**

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Monthly Summary by Reporting System May 2003 through December 2005.....    | V-3 |
| Seasonal Summary by Reporting System Summer 2003 through Summer 2012 ..... | V-6 |

**FORECASTED MONTHLY SYSTEM DEMAND SUMMARY**  
MEGAWATTS

|                    | MAY<br>2003 | JUN<br>2003 | JUL<br>2003 | AUG<br>2003 | SEP<br>2003 | OCT<br>2003 | NOV<br>2003 | DEC<br>2003 | JAN<br>2004 | FEB<br>2004 | MAR<br>2004 | APR<br>2004 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 16          | 20          | 24          | 23          | 23          | 15          | 16          | 17          | 17          | 17          | 15          | 15          |
| AMES               | 91          | 110         | 119         | 107         | 90          | 80          | 72          | 77          | 71          | 73          | 72          | 81          |
| ATL                | 20          | 25          | 26          | 24          | 25          | 19          | 16          | 17          | 17          | 17          | 17          | 17          |
| BEPC               | 935         | 1124        | 1340        | 1207        | 1024        | 975         | 1004        | 1104        | 1220        | 1042        | 1000        | 878         |
| CMMPA              | 65          | 80          | 80          | 78          | 68          | 54          | 57          | 58          | 57          | 56          | 56          | 57          |
| GRE                | 1768        | 2080        | 2264        | 2212        | 1952        | 1562        | 1709        | 1863        | 1858        | 1802        | 1654        | 1579        |
| GSE                | 621         | 731         | 799         | 778         | 709         | 704         | 741         | 788         | 799         | 732         | 724         | 642         |
| HCPD               | 65          | 74          | 83          | 82          | 72          | 68          | 73          | 80          | 82          | 76          | 73          | 71          |
| HMU                | 12          | 14          | 14          | 13          | 14          | 10          | 9           | 10          | 10          | 10          | 10          | 10          |
| HSTG               | 86          | 95          | 101         | 98          | 91          | 73          | 64          | 66          | 67          | 69          | 71          | 74          |
| HUC                | 48          | 55          | 61          | 60          | 55          | 41          | 42          | 43          | 43          | 41          | 41          | 46          |
| LES                | 574         | 679         | 761         | 747         | 653         | 487         | 477         | 515         | 506         | 494         | 471         | 460         |
| MDU                | 328         | 420         | 462         | 449         | 367         | 309         | 337         | 381         | 364         | 348         | 324         | 307         |
| MEAN               | 106         | 127         | 141         | 140         | 122         | 90          | 95          | 103         | 101         | 97          | 93          | 91          |
| MEC                | 3490        | 4408        | 4683        | 4567        | 4138        | 2980        | 3044        | 3267        | 3213        | 3129        | 3030        | 2919        |
| MMPA               | 162         | 183         | 195         | 200         | 156         | 124         | 133         | 134         | 133         | 135         | 128         | 129         |
| MMU                | 75          | 81          | 83          | 81          | 80          | 74          | 73          | 73          | 79          | 74          | 75          | 72          |
| MP                 | 1567        | 1616        | 1649        | 1647        | 1600        | 1616        | 1642        | 1673        | 1675        | 1671        | 1591        | 1536        |
| MPC                | 425         | 430         | 430         | 430         | 420         | 500         | 640         | 770         | 780         | 780         | 650         | 549         |
| MPW                | 122         | 137         | 144         | 141         | 134         | 116         | 117         | 120         | 121         | 121         | 120         | 119         |
| MRES               | 182         | 261         | 306         | 299         | 212         | 154         | 230         | 284         | 292         | 276         | 226         | 193         |
| NPPD               | 1599        | 2024        | 2324        | 2254        | 1969        | 1555        | 1631        | 1725        | 1760        | 1688        | 1610        | 1445        |
| NULM               | 42          | 46          | 49          | 51          | 38          | 31          | 30          | 30          | 29          | 30          | 29          | 31          |
| NWPS               | 218         | 267         | 289         | 298         | 265         | 184         | 187         | 202         | 226         | 195         | 191         | 177         |
| OPPD               | 1844        | 1988        | 2021        | 2048        | 1984        | 1293        | 1350        | 1403        | 1437        | 1346        | 1303        | 1531        |
| OTP                | 565         | 550         | 580         | 604         | 568         | 498         | 583         | 662         | 691         | 694         | 579         | 551         |
| PELLA              | 42          | 46          | 45          | 49          | 44          | 34          | 31          | 31          | 31          | 31          | 34          | 39          |
| RPU                | 203         | 255         | 264         | 260         | 258         | 183         | 173         | 181         | 175         | 169         | 166         | 186         |
| SMMPA              | 215         | 285         | 321         | 304         | 251         | 209         | 231         | 276         | 243         | 234         | 221         | 200         |
| WAPA               | 942         | 1062        | 1129        | 1052        | 1014        | 900         | 1071        | 1141        | 1010        | 950         | 961         | 878         |
| WLMR               | 48          | 59          | 61          | 60          | 55          | 42          | 46          | 46          | 44          | 45          | 43          | 43          |
| WPPI               | 48          | 56          | 63          | 63          | 51          | 45          | 50          | 54          | 52          | 50          | 47          | 46          |
| XCEL               | 6898        | 8142        | 8973        | 8787        | 7274        | 6102        | 6235        | 6363        | 6640        | 6518        | 5937        | 5787        |
|                    |             |             |             |             |             |             |             |             |             |             |             |             |
| MHEB               | 2814        | 2822        | 2870        | 2924        | 2768        | 2964        | 3326        | 3782        | 3804        | 3645        | 3372        | 2911        |
| SPC                | 2364        | 2491        | 2477        | 2596        | 2452        | 2478        | 2740        | 2879        | 2925        | 2844        | 2622        | 2473        |
|                    |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>MAPP-US</b>     | 23423       | 27528       | 29886       | 29212       | 25774       | 21124       | 22211       | 23557       | 23843       | 23011       | 21563       | 20758       |
| <b>MAPP-Canada</b> | 5178        | 5313        | 5347        | 5519        | 5221        | 5441        | 6066        | 6661        | 6729        | 6489        | 5994        | 5384        |
| <b>MAPP-Total</b>  | 28600       | 32841       | 35233       | 34732       | 30995       | 26566       | 28277       | 30218       | 30573       | 29500       | 27557       | 26142       |

**FORECASTED MONTHLY SYSTEM DEMAND SUMMARY**  
MEGAWATTS

|                    | MAY<br>2004 | JUN<br>2004 | JUL<br>2004 | AUG<br>2004 | SEP<br>2004 | OCT<br>2004 | NOV<br>2004 | DEC<br>2004 | JAN<br>2005 | FEB<br>2005 | MAR<br>2005 | APR<br>2005 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 16          | 20          | 25          | 23          | 23          | 15          | 16          | 17          | 17          | 17          | 15          | 15          |
| AMES               | 91          | 111         | 121         | 108         | 92          | 81          | 73          | 78          | 71          | 74          | 72          | 82          |
| ATL                | 20          | 25          | 27          | 24          | 25          | 19          | 17          | 17          | 17          | 17          | 17          | 17          |
| BEPC               | 983         | 1176        | 1395        | 1260        | 1069        | 1008        | 1038        | 1162        | 1246        | 1064        | 1021        | 897         |
| CMMPA              | 67          | 82          | 82          | 80          | 69          | 55          | 58          | 59          | 58          | 57          | 57          | 58          |
| GRE                | 1893        | 2200        | 2366        | 2342        | 2058        | 1656        | 1773        | 1906        | 1906        | 1849        | 1696        | 1572        |
| GSE                | 630         | 745         | 814         | 792         | 720         | 714         | 750         | 798         | 814         | 741         | 733         | 650         |
| HCPD               | 36          | 74          | 83          | 83          | 73          | 69          | 74          | 80          | 83          | 77          | 74          | 72          |
| HMU                | 12          | 14          | 14          | 13          | 14          | 10          | 10          | 10          | 10          | 10          | 10          | 10          |
| HSTG               | 88          | 97          | 103         | 100         | 93          | 75          | 66          | 67          | 69          | 71          | 73          | 76          |
| HUC                | 49          | 56          | 61          | 60          | 56          | 42          | 42          | 43          | 43          | 41          | 42          | 47          |
| LES                | 577         | 684         | 770         | 756         | 660         | 494         | 483         | 521         | 518         | 505         | 481         | 472         |
| MDU                | 331         | 423         | 465         | 452         | 370         | 311         | 340         | 384         | 367         | 351         | 326         | 310         |
| MEAN               | 107         | 128         | 142         | 141         | 124         | 90          | 96          | 104         | 108         | 105         | 101         | 99          |
| MEC                | 3556        | 4473        | 4753        | 4636        | 4216        | 3034        | 3099        | 3329        | 3279        | 3193        | 3093        | 2986        |
| MMPA               | 168         | 190         | 202         | 207         | 161         | 128         | 138         | 139         | 138         | 140         | 133         | 133         |
| MMU                | 76          | 82          | 84          | 82          | 81          | 75          | 74          | 78          | 80          | 75          | 75          | 72          |
| MP                 | 1590        | 1640        | 1674        | 1672        | 1623        | 1640        | 1659        | 1691        | 1693        | 1689        | 1609        | 1553        |
| MPC                | 428         | 432         | 432         | 432         | 423         | 504         | 645         | 780         | 790         | 790         | 660         | 553         |
| MPW                | 124         | 139         | 147         | 144         | 137         | 118         | 119         | 122         | 123         | 123         | 122         | 121         |
| MRES               | 191         | 271         | 318         | 311         | 221         | 161         | 240         | 295         | 302         | 286         | 235         | 201         |
| NPPD               | 1634        | 2059        | 2362        | 2290        | 2001        | 1585        | 1661        | 1758        | 1792        | 1719        | 1639        | 1471        |
| NULM               | 43          | 47          | 50          | 52          | 39          | 32          | 31          | 31          | 29          | 30          | 29          | 32          |
| NWPS               | 220         | 269         | 292         | 302         | 267         | 186         | 189         | 204         | 228         | 197         | 193         | 179         |
| OPPD               | 1917        | 2057        | 2074        | 2108        | 1966        | 1349        | 1386        | 1453        | 1473        | 1440        | 1381        | 1514        |
| OTP                | 568         | 554         | 584         | 608         | 573         | 504         | 589         | 669         | 697         | 701         | 585         | 559         |
| PELLA              | 42          | 46          | 45          | 49          | 44          | 34          | 31          | 31          | 31          | 31          | 35          | 41          |
| RPU                | 209         | 262         | 271         | 267         | 265         | 188         | 178         | 186         | 179         | 172         | 169         | 190         |
| SMMPA              | 224         | 292         | 329         | 311         | 268         | 216         | 240         | 286         | 252         | 246         | 209         | 185         |
| WAPA               | 942         | 1062        | 1129        | 1052        | 1014        | 900         | 1071        | 1141        | 1010        | 950         | 961         | 878         |
| WLMR               | 49          | 60          | 63          | 60          | 56          | 43          | 44          | 47          | 45          | 45          | 43          | 43          |
| WPPI               | 49          | 57          | 64          | 64          | 53          | 46          | 51          | 55          | 53          | 51          | 49          | 47          |
| XCEL               | 7036        | 8304        | 9134        | 8943        | 7423        | 6186        | 6318        | 6444        | 6726        | 6469        | 6023        | 5866        |
| MHEB               | 2808        | 2820        | 2873        | 2933        | 2764        | 2963        | 3341        | 3798        | 3802        | 3655        | 3389        | 2928        |
| SPC                | 2442        | 2574        | 2559        | 2682        | 2534        | 2560        | 2830        | 2974        | 3010        | 2927        | 2699        | 2546        |
| <b>MAPP-US</b>     | 23997       | 28132       | 30476       | 29823       | 26277       | 21567       | 22599       | 23984       | 24248       | 23327       | 21962       | 21001       |
| <b>MAPP-Canada</b> | 5250        | 5394        | 5432        | 5615        | 5298        | 5523        | 6171        | 6772        | 6812        | 6582        | 6088        | 5474        |
| <b>MAPP-Total</b>  | 29246       | 33526       | 35907       | 35439       | 31575       | 27090       | 28770       | 30756       | 31061       | 29909       | 28049       | 26474       |

**FORECASTED MONTHLY SYSTEM DEMAND SUMMARY**  
MEGAWATTS

|             | MAY<br>2005 | JUN<br>2005 | JUL<br>2005 | AUG<br>2005 | SEP<br>2005 | OCT<br>2005 | NOV<br>2005 | DEC<br>2005 |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN        | 16          | 21          | 25          | 24          | 24          | 16          | 16          | 18          |
| AMES        | 91          | 112         | 123         | 109         | 93          | 82          | 74          | 79          |
| ATL         | 20          | 26          | 27          | 25          | 25          | 19          | 17          | 17          |
| BEPC        | 998         | 1192        | 1415        | 1279        | 1086        | 1024        | 1055        | 1181        |
| CMMPA       | 68          | 83          | 83          | 81          | 71          | 56          | 60          | 60          |
| GRE         | 1972        | 2292        | 2465        | 2440        | 2145        | 1726        | 1815        | 1952        |
| GSE         | 640         | 759         | 831         | 808         | 733         | 724         | 760         | 807         |
| HCPD        | 66          | 75          | 84          | 83          | 74          | 69          | 75          | 81          |
| HMU         | 12          | 15          | 15          | 14          | 14          | 10          | 10          | 10          |
| HSTG        | 90          | 100         | 106         | 103         | 96          | 77          | 68          | 69          |
| HUC         | 49          | 56          | 62          | 61          | 57          | 43          | 43          | 44          |
| LES         | 591         | 699         | 790         | 776         | 673         | 510         | 495         | 533         |
| MDU         | 334         | 427         | 469         | 456         | 373         | 314         | 343         | 387         |
| MEAN        | 116         | 137         | 151         | 150         | 133         | 100         | 107         | 115         |
| MEC         | 3637        | 4569        | 4854        | 4734        | 4310        | 3093        | 3160        | 3397        |
| MMPA        | 175         | 197         | 210         | 215         | 167         | 133         | 143         | 144         |
| MMU         | 77          | 83          | 85          | 83          | 82          | 76          | 75          | 79          |
| MP          | 1609        | 1660        | 1694        | 1692        | 1643        | 1660        | 1677        | 1709        |
| MPC         | 431         | 434         | 434         | 434         | 428         | 508         | 650         | 790         |
| MPW         | 126         | 141         | 149         | 146         | 139         | 120         | 121         | 124         |
| MRES        | 200         | 282         | 330         | 322         | 231         | 169         | 251         | 307         |
| NPPD        | 1665        | 2093        | 2401        | 2328        | 2034        | 1615        | 1692        | 1791        |
| NULM        | 44          | 48          | 51          | 54          | 40          | 33          | 32          | 32          |
| NWPS        | 223         | 272         | 295         | 306         | 270         | 188         | 191         | 206         |
| OPPD        | 1967        | 2107        | 2138        | 2162        | 2114        | 1464        | 1419        | 1441        |
| OTP         | 575         | 561         | 593         | 614         | 578         | 510         | 594         | 678         |
| PELLA       | 44          | 47          | 46          | 51          | 45          | 35          | 31          | 31          |
| RPU         | 213         | 267         | 276         | 272         | 270         | 192         | 181         | 190         |
| SMPA        | 227         | 299         | 337         | 318         | 279         | 224         | 250         | 296         |
| WAPA        | 942         | 1062        | 1129        | 1052        | 1014        | 900         | 1071        | 1141        |
| WLMR        | 50          | 61          | 65          | 63          | 58          | 44          | 45          | 48          |
| WPPI        | 51          | 58          | 66          | 65          | 54          | 47          | 52          | 56          |
| XCEL        | 7176        | 8464        | 9289        | 9091        | 7565        | 6259        | 6359        | 6514        |
|             |             |             |             |             |             |             |             |             |
| MHEB        | 2810        | 2827        | 2887        | 2946        | 2766        | 2959        | 3356        | 3818        |
| SPC         | 2514        | 2649        | 2634        | 2760        | 2608        | 2635        | 2913        | 3061        |
|             |             |             |             |             |             |             |             |             |
| MAPP-US     | 24494       | 28698       | 31088       | 30409       | 26917       | 22038       | 22929       | 24326       |
| MAPP-Canada | 5323        | 5476        | 5521        | 5707        | 5374        | 5594        | 6269        | 6879        |
| MAPP-Total  | 29817       | 34174       | 36609       | 36115       | 32291       | 27632       | 29198       | 31205       |

**FORECASTED SEASONAL SYSTEM DEMAND SUMMARY**  
MEGAWATTS

|                    | SUM<br>2003 | WIN<br>2003 | SUM<br>2004 | WIN<br>2004 | SUM<br>2005 | WIN<br>2005 | SUM<br>2006 | WIN<br>2006 | SUM<br>2007 | WIN<br>2007 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 24          | 17          | 25          | 17          | 25          | 18          | 26          | 18          | 26          | 19          |
| AMES               | 119         | 77          | 121         | 78          | 123         | 79          | 124         | 80          | 126         | 81          |
| ATL                | 26          | 17          | 27          | 17          | 27          | 17          | 27          | 17          | 27          | 17          |
| BEPC               | 1340        | 1220        | 1395        | 1246        | 1415        | 1269        | 1440        | 1288        | 1461        | 1303        |
| CMPA               | 80          | 58          | 82          | 59          | 83          | 61          | 84          | 62          | 86          | 63          |
| GRE                | 2264        | 1863        | 2366        | 1906        | 2465        | 1952        | 2560        | 1998        | 2658        | 2046        |
| GSE                | 799         | 799         | 814         | 814         | 831         | 831         | 847         | 847         | 865         | 860         |
| HCPD               | 83          | 82          | 83          | 83          | 84          | 83          | 85          | 84          | 85          | 84          |
| HMU                | 14          | 10          | 14          | 10          | 15          | 10          | 15          | 11          | 15          | 11          |
| HSTG               | 101         | 71          | 103         | 73          | 106         | 75          | 109         | 77          | 112         | 79          |
| HUC                | 61          | 43          | 61          | 43          | 62          | 44          | 62          | 44          | 63          | 45          |
| LES                | 761         | 515         | 770         | 521         | 790         | 533         | 806         | 541         | 824         | 552         |
| MDU                | 462         | 381         | 465         | 384         | 469         | 387         | 473         | 390         | 477         | 393         |
| MEAN               | 141         | 103         | 142         | 108         | 151         | 112         | 152         | 113         | 153         | 114         |
| MEC                | 4683        | 3267        | 4753        | 3329        | 4854        | 3404        | 4954        | 3472        | 5061        | 3558        |
| MMPA               | 200         | 135         | 207         | 140         | 215         | 149         | 223         | 155         | 231         | 161         |
| MMU                | 83          | 79          | 84          | 80          | 85          | 82          | 87          | 84          | 89          | 86          |
| MP                 | 1649        | 1675        | 1674        | 1693        | 1694        | 1711        | 1709        | 1726        | 1724        | 1741        |
| MPC                | 430         | 780         | 432         | 790         | 434         | 800         | 436         | 810         | 438         | 820         |
| MPW                | 144         | 121         | 147         | 123         | 149         | 126         | 152         | 127         | 154         | 129         |
| MRES               | 306         | 292         | 318         | 302         | 330         | 314         | 345         | 325         | 356         | 335         |
| NPPD               | 2324        | 1760        | 2362        | 1792        | 2401        | 1826        | 2441        | 1859        | 2481        | 1892        |
| NULM               | 51          | 30          | 52          | 31          | 54          | 32          | 55          | 32          | 56          | 33          |
| NWPS               | 298         | 226         | 302         | 228         | 306         | 230         | 309         | 232         | 312         | 234         |
| OPPD               | 2048        | 1437        | 2108        | 1473        | 2162        | 1514        | 2229        | 1587        | 2329        | 1633        |
| OTP                | 604         | 694         | 608         | 701         | 614         | 712         | 620         | 715         | 626         | 723         |
| PELLA              | 49          | 34          | 49          | 35          | 51          | 35          | 51          | 36          | 52          | 36          |
| RPU                | 264         | 181         | 271         | 186         | 276         | 186         | 283         | 190         | 290         | 194         |
| SMMPA              | 321         | 299         | 329         | 309         | 337         | 311         | 346         | 317         | 353         | 318         |
| WAPA               | 1129        | 1141        | 1129        | 1141        | 1129        | 1141        | 1129        | 1141        | 1129        | 1141        |
| WLMR               | 61          | 46          | 63          | 47          | 65          | 48          | 67          | 49          | 69          | 50          |
| WPPI               | 63          | 54          | 64          | 55          | 66          | 56          | 67          | 57          | 68          | 58          |
| XCEL               | 8973        | 6640        | 9134        | 6726        | 9289        | 6798        | 9451        | 6882        | 9617        | 6969        |
| MHEB               | 2924        | 3804        | 2933        | 3802        | 2946        | 3818        | 2983        | 3845        | 3004        | 3856        |
| SPC                | 2596        | 2925        | 2682        | 3010        | 2760        | 3107        | 2802        | 3150        | 2841        | 3224        |
| <b>MAPP-US</b>     | 29957       | 24148       | 30555       | 24541       | 31156       | 24947       | 31763       | 25367       | 32413       | 25779       |
| <b>MAPP-Canada</b> | 5519        | 6729        | 5615        | 6812        | 5707        | 6925        | 5785        | 6995        | 5845        | 7080        |
| <b>MAPP-Total</b>  | 35476       | 30877       | 36170       | 31353       | 36863       | 31872       | 37548       | 32362       | 38258       | 32859       |



**FORECASTED SEASONAL SYSTEM DEMAND SUMMARY**  
MEGAWATTS

|                    | SUM<br>2008 | WIN<br>2008 | SUM<br>2009 | WIN<br>2009 | SUM<br>2010 | WIN<br>2010 | SUM<br>2011 | WIN<br>2011 | SUM<br>2012 |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ALGN               | 27          | 19          | 27          | 19          | 28          | 20          | 28          | 20          | 29          |
| AMES               | 128         | 82          | 130         | 83          | 132         | 83          | 132         | 83          | 132         |
| ATL                | 28          | 17          | 28          | 18          | 28          | 18          | 29          | 18          | 29          |
| BEPC               | 1476        | 1319        | 1497        | 1334        | 1511        | 1352        | 1532        | 1367        | 1549        |
| CMMPA              | 87          | 64          | 89          | 65          | 90          | 67          | 92          | 68          | 94          |
| GRE                | 2759        | 2097        | 2863        | 2154        | 2974        | 2205        | 3078        | 2257        | 3185        |
| GSE                | 880         | 871         | 897         | 882         | 913         | 893         | 930         | 904         | 947         |
| HCPD               | 85          | 85          | 86          | 85          | 86          | 86          | 87          | 86          | 87          |
| HMU                | 15          | 11          | 16          | 11          | 16          | 11          | 16          | 11          | 16          |
| HSTG               | 115         | 81          | 118         | 83          | 121         | 85          | 124         | 87          | 127         |
| HUC                | 63          | 45          | 64          | 46          | 64          | 46          | 65          | 46          | 65          |
| LES                | 841         | 561         | 856         | 567         | 872         | 578         | 888         | 589         | 903         |
| MDU                | 481         | 396         | 484         | 399         | 488         | 401         | 492         | 404         | 496         |
| MEAN               | 155         | 116         | 156         | 116         | 158         | 118         | 160         | 119         | 162         |
| MEC                | 5171        | 3630        | 5272        | 3703        | 5373        | 3775        | 5467        | 3841        | 5558        |
| MMPA               | 240         | 167         | 249         | 173         | 258         | 179         | 268         | 186         | 278         |
| MMU                | 91          | 88          | 93          | 90          | 95          | 92          | 97          | 94          | 99          |
| MP                 | 1738        | 1754        | 1764        | 1778        | 1779        | 1792        | 1800        | 1811        | 1815        |
| MPC                | 440         | 830         | 442         | 840         | 444         | 850         | 446         | 860         | 448         |
| MPW                | 156         | 131         | 158         | 133         | 161         | 134         | 163         | 136         | 165         |
| MRES               | 368         | 345         | 379         | 355         | 391         | 367         | 405         | 379         | 417         |
| NPPD               | 2521        | 1926        | 2562        | 1960        | 2603        | 1994        | 2645        | 2030        | 2687        |
| NULM               | 58          | 34          | 59          | 35          | 61          | 36          | 62          | 37          | 64          |
| NWPS               | 315         | 236         | 318         | 238         | 322         | 240         | 325         | 242         | 328         |
| OPPD               | 2390        | 1669        | 2448        | 1693        | 2483        | 1717        | 2524        | 1737        | 2568        |
| OTP                | 633         | 727         | 639         | 733         | 647         | 736         | 649         | 737         | 649         |
| PELLA              | 52          | 37          | 53          | 38          | 53          | 39          | 54          | 40          | 54          |
| RPU                | 297         | 199         | 305         | 204         | 313         | 209         | 320         | 215         | 328         |
| SMPA               | 361         | 320         | 369         | 322         | 377         | 323         | 385         | 329         | 394         |
| WAPA               | 1129        | 1141        | 1129        | 1141        | 1129        | 1141        | 1129        | 1141        | 1129        |
| WLMR               | 71          | 51          | 73          | 52          | 74          | 53          | 75          | 54          | 77          |
| WPPI               | 69          | 60          | 70          | 61          | 72          | 62          | 73          | 63          | 74          |
| XCEL               | 9782        | 7059        | 9945        | 7150        | 10113       | 7244        | 10271       | 7332        | 10430       |
|                    |             |             |             |             |             |             |             |             |             |
| MHEB               | 3040        | 3881        | 3074        | 3904        | 3110        | 3931        | 3155        | 3967        | 3186        |
| SPC                | 2908        | 3277        | 2955        | 3325        | 2999        | 3359        | 3029        | 3374        | 3043        |
|                    |             |             |             |             |             |             |             |             |             |
| <b>MAPP-US</b>     | 33022       | 26167       | 33640       | 26561       | 34228       | 26946       | 34811       | 27323       | 35383       |
| <b>MAPP-Canada</b> | 5947        | 7158        | 6029        | 7229        | 6109        | 7290        | 6185        | 7341        | 6229        |
| <b>MAPP-Total</b>  | 38969       | 33325       | 39669       | 33790       | 40337       | 34236       | 40996       | 34664       | 41612       |

# **NET ENERGY REQUIREMENTS**

**ANNUAL NET ENERGY REQUIREMENTS 2003 through 2012**

Annual Summary by Reporting System .....VI-3

**FORECAST ANNUAL NET ENERGY**  
**GIGAWATT HOURS**

|                    | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   | 2012   |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| ALGN               | 116    | 116    | 117    | 120    | 123    | 125    | 128    | 130    | 133    | 135    |
| AMES               | 547    | 554    | 566    | 576    | 586    | 596    | 606    | 616    | 616    | 616    |
| ATL                | 109    | 110    | 112    | 113    | 114    | 115    | 117    | 118    | 119    | 120    |
| BEPC               | 7127   | 7523   | 7659   | 7776   | 7889   | 8012   | 8098   | 8183   | 8281   | 8371   |
| CMMPA              | 399    | 407    | 415    | 423    | 432    | 440    | 449    | 458    | 467    | 477    |
| GRE                | 11726  | 12535  | 12911  | 13285  | 13671  | 14067  | 14489  | 14938  | 15357  | 15787  |
| GSE                | 4514   | 4585   | 4671   | 4758   | 4844   | 4935   | 5029   | 5128   | 5223   | 5317   |
| HCPD               | 537    | 541    | 548    | 556    | 561    | 565    | 570    | 575    | 580    | 584    |
| HMU                | 65     | 65     | 66     | 67     | 68     | 69     | 70     | 72     | 73     | 74     |
| HSTG               | 483    | 494    | 507    | 519    | 533    | 547    | 561    | 576    | 591    | 606    |
| HUC                | 317    | 325    | 331    | 335    | 341    | 346    | 351    | 357    | 362    | 367    |
| LES                | 3448   | 3518   | 3615   | 3695   | 3789   | 3875   | 3940   | 4034   | 4127   | 4209   |
| MDU                | 2209   | 2226   | 2248   | 2267   | 2287   | 2305   | 2322   | 2336   | 2351   | 2365   |
| MEAN               | 617    | 631    | 684    | 694    | 704    | 715    | 726    | 737    | 748    | 759    |
| MEC                | 21138  | 21635  | 22100  | 22505  | 22899  | 23352  | 23745  | 24142  | 24540  | 24963  |
| MMPA               | 945    | 980    | 1017   | 1055   | 1094   | 1135   | 1178   | 1222   | 1267   | 1315   |
| MMU                | 580    | 591    | 602    | 615    | 628    | 641    | 654    | 668    | 682    | 696    |
| MP                 | 12367  | 12461  | 12467  | 12490  | 12520  | 12567  | 12610  | 12742  | 12834  | 12954  |
| MPC                | 3750   | 3844   | 3940   | 4039   | 4139   | 4243   | 4349   | 4458   | 4569   | 4683   |
| MPW                | 918    | 936    | 954    | 977    | 992    | 1007   | 1023   | 1039   | 1055   | 1072   |
| MRES               | 1560   | 1618   | 1683   | 1758   | 1816   | 1875   | 1934   | 1992   | 2067   | 2126   |
| NPPD               | 11886  | 12122  | 12356  | 12595  | 12838  | 13089  | 13338  | 13589  | 13846  | 14104  |
| NULM               | 200    | 204    | 208    | 212    | 216    | 221    | 225    | 230    | 234    | 239    |
| NWPS               | 1349   | 1376   | 1403   | 1431   | 1459   | 1488   | 1518   | 1548   | 1580   | 1611   |
| OPPD               | 9721   | 10063  | 10415  | 10774  | 11141  | 11365  | 11562  | 11798  | 11949  | 12154  |
| OTP                | 3842   | 3881   | 3939   | 3980   | 4011   | 4051   | 4082   | 4124   | 4135   | 4135   |
| PELLA              | 198    | 198    | 209    | 209    | 209    | 209    | 210    | 210    | 210    | 211    |
| RPU                | 1312   | 1344   | 1374   | 1412   | 1447   | 1483   | 1520   | 1558   | 1597   | 1637   |
| SMMPA              | 2836   | 2926   | 3014   | 3105   | 3180   | 3254   | 3329   | 3407   | 3486   | 3561   |
| WAPA               | 7204   | 7904   | 8438   | 9190   | 9005   | 9479   | 9479   | 9479   | 9479   | 9479   |
| WLMR               | 279    | 286    | 293    | 299    | 305    | 311    | 318    | 324    | 330    | 336    |
| WPPI               | 312    | 318    | 325    | 332    | 338    | 345    | 352    | 359    | 365    | 372    |
| XCEL               | 44907  | 45771  | 46418  | 47154  | 47984  | 48950  | 49689  | 50590  | 51449  | 52443  |
| MHEB               | 21305  | 21550  | 21689  | 21904  | 22122  | 22336  | 22552  | 22796  | 23066  | 23331  |
| SPC                | 18714  | 19430  | 19978  | 20269  | 20570  | 21115  | 21441  | 21794  | 22014  | 22157  |
| <b>MAPP-US</b>     | 157518 | 162091 | 165604 | 169315 | 172163 | 175777 | 178570 | 181736 | 184702 | 187878 |
| <b>MAPP-Canada</b> | 40019  | 40980  | 41667  | 42173  | 42692  | 43451  | 43993  | 44590  | 45080  | 45488  |
| <b>MAPP-Total</b>  | 197537 | 203071 | 207271 | 211488 | 214855 | 219228 | 222563 | 226326 | 229783 | 233366 |

# **BULK ELECTRICAL TRANSMISSION MAP**

Section VII

## **BULK ELECTRICAL TRANSMISSION MAP**

The Mid-Continent Area Power Pool prepares a Bulk Electrical Transmission Map, which details existing and proposed facilities each year for a ten-year period.

For ordering information, contact:

MAPPCOR  
1125 Energy Park Drive  
Saint Paul, MN 55108-5001  
(651) 632-8400

# **PROPOSED BULK ELECTRIC TRANSMISSION LINE ADDITIONS**

Section VIII

### **PROPOSED BULK ELECTRIC TRANSMISSION LINE ADDITIONS**

This item contains a list of the bulk electric transmission lines significant for interconnected operation proposed for installation during the ten years of the reporting period. The list covers transmission lines rated 230 kV and above.

Column 01: Identifies the line owners by name abbreviation and EIA utility code.

Column 02: Identifies each terminal of the facility.

Column 03: Shows the line length in circuit miles.

Column 04: The date that the facility is expected to be in service.

Column 05: The nominal operating voltage in kilovolts (kV).

Column 06: The nominal design voltage in kilovolts (kV).



### List of Proposed Bulk Transmission Lines

| Entity Name                   | Entity<br>EIA Code | From Location      | To Location      | Line Length<br>in Circuit Miles | Expected<br>Service Date | Operating<br>Voltage kV | Design<br>Voltage kV |
|-------------------------------|--------------------|--------------------|------------------|---------------------------------|--------------------------|-------------------------|----------------------|
| 1                             |                    | 2                  |                  | 3                               | 4                        | 5                       | 6                    |
| Dairyland Power Cooperative   | 4716               | Apple River        | Chisago          | 36                              | 2006-07                  | 161                     | 161                  |
| Dairyland Power Cooperative   | 4716               | Apple River        | Chisago          | 2                               | 2006-07                  | 115                     | 115                  |
| LES                           | 11018              | 14th & Fletcher    | 84th & Buff      | 3                               | 2003-04                  | 115                     | 115                  |
| LES                           | 11018              | 19th & Alvo        | NW 12th & Arbor  | 4                               | 2003-11                  | 115                     | 115                  |
| LES                           | 11018              | NW 68th & Holdrege | NW 12th & Arbor  | 11                              | 2005-05                  | 115                     | 115                  |
| LES                           | 11018              | Rokeby             | 40th & Rokeby    | 5                               | 2006-05                  | 115                     | 115                  |
| LES                           | 11018              | NW 68th & Holdrege | 128th & Adams    | 28                              | 2007-05                  | 345                     | 345                  |
| Manitoba Hydro Electric Board | -200               | Herblet Lake       | Sherridon        | 45                              | 2006-10                  | 115                     | 115                  |
| Manitoba Hydro Electric Board | -200               | Herblet Lake       | Chisel Lake      | 4                               | 2006-10                  | 115                     | 115                  |
| Manitoba Hydro Electric Board | -200               | Silver             | Rosser           | 57                              | 2005-10                  | 230                     | 230                  |
| Manitoba Hydro Electric Board | -200               | Dorsey             | Portage South    | 44                              | 2008-10                  | 230                     | 230                  |
| Minnesota Power               | 12647              | ARROWHEAD          | WESTON, WI       | 220                             | 2005-06                  | 345                     | 345                  |
| Minnesota Power               | 12647              | Arrowhead          | MN-WI State line | 12                              | 2005-06                  | 345                     | 345                  |
| American Transmission Company | 659                | MN-WI State Line   | Weston           | 207                             | 2005-06                  | 345                     | 345                  |
| NPPD                          | 13337              | Broken Bow         | Crooked Creek    | 40                              | 2003-04                  | 115                     | 115                  |
| OPPD                          | 14127              | Sub 3458           | Under Plan       | 68                              | 2009-04                  | 345                     | 345                  |
| Otter Tail Power Co.          | 14232              | Frazee             | Audubon          | 20                              | 2004-12                  | 115                     | 115                  |
| Otter Tail Power Co.          | 14232              | Canby              | Dawson           | 22                              | 2004-12                  | 115                     | 115                  |
| Otter Tail Power Co.          | 14232              | Dawson             | Appleton         | 22                              | 2008-12                  | 115                     | 115                  |
| NSP                           | 1904               | Chisago            |                  | 36                              | 2004-06                  | 161                     | 161                  |
| NSP                           | 1904               | Ironwood           | Gogebic          | 34                              | 2005-11                  | 115                     | 115                  |
| NSP                           | 1904               | Wilmarth           | West Faribault   | 53                              | 2003-05                  | 161                     | 161                  |
| NSP                           | 1904               | Air Lake           | Empire           | 18                              | 2003-05                  | 115                     | 115                  |
| NSP                           | 1904               | Red Rock           | Rogers Lake      | 6                               | 2003-05                  | 115                     | 115                  |
| NSP                           | 1904               | Rugby Substation   | Canada Border    | 53                              | 2002-10                  | 230                     | 230                  |

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CCC/NFAAT/S/2

**Request:** The Crown Corporations Council requested a summary of the new information from the updated 2003 Power Resource Plan and sensitivity analysis regarding its implications on Wuskwatim evaluations.

**Response:** Since the economic evaluations of Wuskwatim advancement reported in the main submission are based on the 2002/2003 Power Resource Plan, the impact on the IRR of incorporating the 2003/2004 Resource Plan is examined to ensure that prior studies and sensitivities continue to be valid for the purposes of evaluating the economics of the Wuskwatim Project.

Compared to the 2002/03 Power Resource Plan, the 2003/2004 Power Resource Plan includes 250 MW of wind development, additional upgrades to existing facilities, higher load forecast and current demand-side management projections, adjusted to account for most recent savings to date estimates. Under these assumptions, new generation would be needed in 2019 to meet domestic load and Wuskwatim would be the recommended next plant (as opposed to the 2002/2003 Power Resource Plan sequence in which Wuskwatim development occurred in 2020). The sensitivity therefore not only includes the impact of the 2003/04 assumptions, it also includes the effect of advancing Wuskwatim not from 2020, but from 2019 instead. (Further details of the 2003/04 Power Resource Plan are included in the attached CCC/NFAAT/S/2a.

The economic evaluation of Wuskwatim advancement has been recalculated with the changes from the 2003/2004 PRP. The overall impact on the IRR is a reduction of 0.1%, i.e. the IRR drops from 10.3% to 10.2%. This calculation also includes the impact of the updated Economic Outlook resulting in slightly lower future escalation in U.S. export prices

The generation sequence recommended for the 2003/04 IFF is Wuskwatim 2009/10 followed by Gull 2022/23. The evaluations submitted April 30, 2003 in the "Need For and Alternatives to the

- 1 Wuskwatim Project" are judged to still be appropriate for use with the current resource plan  
2 recommendation. The sensitivities included in that submission are extensive. The current results  
3 continue to indicate that the development sequence of Wuskwatim followed by Gull is the best  
4 generation sequence to meet Manitoba load under a wide range of sensitivity factors. The  
5 updated set of factors in the 2003/04 Resource Plan fall well within the range of sensitivities that  
6 were assessed in the submission.  
7  
8 Financial sensitivities are not completed at this time, but will be provided when available.

**CCC/NFAAT/S/2a**

## **2003/04 Power Resource Plan Report**

**Power Planning and Development Division**

**July 2003**

## TABLE OF CONTENT

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| 2003/04 Power Resource Plan .....                       | 1 |
| Base Case Power Resource Plan for the 2003/04 IFF ..... | 1 |
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### Attachments:

Table A: Dependable Energy (GWh) Base Manitoba Load Forecast - Supply/Demand Balance  
2003 IFF Sequence

Table B: Annual Peak Capacity (MW): Base Manitoba Load Forecast - Supply/Demand Balance  
2003 IFF Sequence

Figure 1a and Figure 1b: 2003 Manitoba Base Load Forecast

## **2003/04 Power Resource Plan**

The "Need For and Alternatives To the Wuskwatim Project" report recently submitted to the Manitoba Clean Environment Commission (CEC) contains comprehensive evaluations on the Wuskwatim project, including sensitivities and analyses of alternatives to Wuskwatim development. That document includes consideration of most of the long-term issues normally considered in the Power Resource Plan report and in many ways is more detailed than traditional Power Resource Plans. Although the 2003/04 Power Resource Plan incorporates updates to key variables, including the addition of 250 MW of wind, the 2003 Manitoba Load Forecast and current supply and DSM assumptions, this information is used only to adjust the in-service dates required for future plants. No new economic analysis has been conducted and economic conclusions rely on work conducted for the "Need For and Alternatives To the Wuskwatim Project" report, which continues to indicate that Wuskwatim is least cost option for next plant.

### **Base Case Power Resource Plan for the 2003/04 IFF**

The 2003/04 Power Resource Plan, utilizing evaluations conducted in the "Need for and Alternatives To The Wuskwatim Project" has been updated to include 250 MW of wind generation, additional upgrades to existing facilities, a higher base domestic load forecast, and current demand-side management projections, adjusted to account for most recent savings to date estimates. The following Power Resource Plan has been adopted for use in the 2003/04 IFF and the 20 year capital plan.

#### Supply-Side Enhancement Projects (SSE)

Total: 670 MW/3339 GWh by Mar 2012 including:

|                          |                             |
|--------------------------|-----------------------------|
| Achieved to Date:        | 140 MW/732 GWh by Mar 2003  |
| Planned Additional:      | 216 MW/ 457 GWh by Mar 2012 |
| Kelsey Rerunning         | (75 MW/0 GWh) by 2011/12    |
| HVDC Bipole III Line     | (86 MW/437 GWh) by 2010/11  |
| Winnipeg River Plants    | (10 MW/20 GWh)              |
| Northern AC Enhancements | (45 MW/undetermined)        |

## License Review and Continuation of Operation: 314 MW/2150 GWh

|                |                   |                                |
|----------------|-------------------|--------------------------------|
| Pointe du Bois | (77 MW/320 GWh)   | License Review Dec. 2011       |
| Selkirk #1-2   | (132 MW/1030 GWh) | License Review 2005/06-2019/20 |
| Brandon #5     | (105 MW/800 GWh)  | License Review 2006/07-2018/19 |

Demand Side Management Program (DSM)

Completed and Planned: 299 MW/ 983 GWh by Mar 2012

New Generation

## Wind:

|           |          |         |
|-----------|----------|---------|
| Phase I   | (100 MW) | 2005/06 |
| Phase II  | (50 MW)  | 2006/07 |
| Phase III | (50 MW)  | 2007/08 |
| Phase IV  | (50 MW)  | 2008/09 |

## Hydro:

|           |          |         |
|-----------|----------|---------|
| Wuskwatim | (200 MW) | 2009/10 |
| Gull      | (620 MW) | 2022/23 |

Figure 1(a) provides current energy projections for total firm load and supply (resources). The total load includes the 2003 base domestic forecast and current committed firm exports. The resources include the ongoing operation of existing generation that has already been committed such as Brandon #5 (2006/07) and Selkirk #1 & 2 (2005/06), although these still must pass through the regulatory process. Successful license review for Brandon #5 and Selkirk #1 & 2 will allow the lives of these facilities to extend to the years 2018/19 and 2019/20 respectively. The energy and capacity available from reduction in transmission losses resulting from construction and system operation of Bipole III line (2010/11) has been included.

### **Changes from Last Year**

The projection of resources now includes capacity and energy that is expected to be available to the Manitoba Hydro System from a total of 250MW of proposed wind developments. The Corporation has committed to 250MW of wind generation provided that it is technically and economically and financially viable. Manitoba Hydro is currently undertaking wind monitoring at seven sites in the province. It is expected that wind power will be developed at one or more of these sites with an in-service-date as early as 2005/06.

In 2002, approval was obtained to undertake a Kelsey rerunning project that is expected to result in an increase of 25 MW. This approved project could be upgraded further to obtain up to an additional 50 MW at Kelsey for a total enhancement of 75 MW. This total enhancement of 75 MW has been included in the resource plan, although approval for the additional 50 MW has not been obtained at this time.

The increase in dependable energy compared to last year, resulting from other Supply-Side Enhancements (completed by end of March 2003) now include estimates for energy gains resulting from programs such as ice management, reservoir optimization, improved thermal operating limits and life assurance.

The projection includes Option 4 DSM derived from the 2001/02 plan adjusted to be incremental to the savings achieved to date. Long range DSM plans remain unchanged from last year. Future DSM options are currently in the process of being updated, including an assessment of maximum market attainable DSM potential and potential reductions associated with the Winnipeg Hydro acquisition. It is expected that a revised DSM plan will be included in the 2004/05 Power Resource Plan.

In summary, whereas the 2002/2003 Power Resource Plan included Wuskwatim-2020 and Gull-2023, the approved sequence for the 2003/2004 Power Resource Plan now includes Wuskwatim-2009 and Gull-2022. A higher load forecast of about 960 GWh in 2020/21 is largely offset by additional firm energy available from wind power estimated to be around 720 GWh. This results



in a net change of about 240 GWh (more load) in 2020/21, but would have meant advancing Wuskwatim to 2019/20 to meet domestic load. Instead, the "Need For and Alternatives To the Wuskwatim Project" process has been initiated to protect an in-service date of 2009 for Wuskwatim, which is reflected in the Plan. The in-service date of Gull is advanced to 2022 (compared to 2023 in the 2002/2003 IFF) to support a deficit of approximately 300 GWh in that year. Figure 1(b) and Table A depict the energy balances, and Table B depicts capacity balances for the recommended IFF sequence.

### **Uncertainty with Regards to Plan**

Some uncertainty with regards to factors such as load growth, inability to develop planned additions and inability to extend existing operations, could affect the timing, the sequence and the extent of development of the resources indicated in this plan.

Although only a 25 MW capacity increase for Kelsey rerunning has been approved, the proposed project providing 75 MW of incremental capacity assumed for the 2003/04 Power Resource Plan has no associated dependable energy and does not affect the timing of new generation.

No final commitment decisions have been made on specific facilities. Wind would only be developed when proven to be technical, economic and financially viable. Studies and negotiations related to wind development are still ongoing.

There is a risk that planned transmission improvements and developments will be delayed from their current schedules. Specifically, the 2010/2011 in-service date of the Bipole III HVDC line is subject to an extensive community consultation and environmental process. Delays to in-service of the line do not have the potential to affect resource requirements unless delays extend into the 2020 timeframe, which is unlikely.

Brandon Unit#5 License Review (LR) for continuing operation is assumed to occur before 2006/07. However, there is some uncertainty that continued operation to 2018/19 might not be technically or economically feasible. Uncertainty with respect to Brandon Unit #5 LR does not affect the timing of next plant for domestic load requirements as the current plan assumes unit #5 retirement has already occurred before the domestic requirement for new plant.

There are a range of options for the rehabilitation/redevelopment of Pointe du Bois and Slave Falls Generating Stations. Engineering studies are currently underway and a recommendation will be forthcoming once an evaluation has been completed.

The Clean Environment Commission review process has been initiated to protect an in-service date of 2009 for Wuskwatim. Although, no decision has been made at this time to proceed with Wuskwatim development, development of Wuskwatim for 2009 mitigates against the risks that load growth could be higher than forecast, or planned-for supply options, such as wind or Supply-Side Enhancements, may not be fully realized. Despite the assumption that Wuskwatim will proceed in 2009, next plant (Gull) might still be required to be advanced under these conditions.

**TABLE A**  
**DEPENDABLE ENERGY (GWh): BASE MANITOBA LOAD FORECAST**  
**Supply/Demand Balance - 2003 IFF Sequence**  
Wind (250 MW) - 2005, Muskegum - 2009, Gull - 2022, S.C.C.T. - 2031, S.C.C.T. - 2035  
Resource and Demand at the Generation Level

Page 1 of 2

| Fiscal Year Beginning April          | 2005/06      | 2006/07      | 2007/08      | 2008/09      | 2009/10      | 2010/11      | 2011/12      | 2012/13      | 2013/14      | 2014/15      | 2015/16      | 2016/17      | 2017/18      | 2018/19      | 2019/20      | 2020/21      | 2021/22      |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Power Resources</b>               |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| <b>Manitoba Hydroelectric Plants</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Shelving-Melting Mill Unit           | 21170        | 21160        | 21140        | 21120        | 21110        | 21090        | 21080        | 21060        | 21040        | 21030        | 20990        | 20980        | 20940        | 20930        | 20910        | 20880        | 20860        |
| All Other HEP                        | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| S.C.C.T.                             | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| <b>500 MW HVDC Bode II</b>           | 0            | 0            | 0            | 0            | 0            | 437          | 437          | 437          | 437          | 437          | 437          | 437          | 437          | 437          | 437          | 437          | 437          |
| <b>Manitoba Thermal Plants</b>       |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Brandon Unit 5 (License Renewal)     | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 000          | 0            | 0            | 0            |
| Selkirk Unit 2 (License Renewal)     | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 0            | 0            |
| Brandon Unit 6 (S.C.C.T.)            | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         | 2300         |
| S.C.C.T.s                            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| <b>Wind</b>                          | 215          | 350          | 600          | 640          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          |
| <b>Demand Side Management</b>        | 190          | 242          | 291          | 337          | 377          | 413          | 445          | 469          | 492          | 519          | 543          | 569          | 597          | 610          | 637          | 667          | 640          |
| <b>Water Runoff</b>                  |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Water Runoff                         | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| <b>Imports</b>                       | 2000         | 2790         | 3579         | 3540         | 3580         | 3590         | 3590         | 3540         | 2980         | 2560         | 2550         | 2114         | 1824         | 1430         | 1430         | 1430         | 1430         |
| <b>TOTAL POWER RESOURCES</b>         | <b>28643</b> | <b>28871</b> | <b>28642</b> | <b>28792</b> | <b>28772</b> | <b>30597</b> | <b>30619</b> | <b>30025</b> | <b>30828</b> | <b>30842</b> | <b>30422</b> | <b>29879</b> | <b>29395</b> | <b>28912</b> | <b>28411</b> | <b>27361</b> | <b>27373</b> |
| <b>Demand</b>                        |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| 2005 Base Load                       | 21150        | 21140        | 21120        | 21100        | 21090        | 21070        | 21060        | 21040        | 21020        | 21010        | 20970        | 20960        | 20920        | 20910        | 20890        | 20860        | 20840        |
| Base IFF                             | 4110         | 5803         | 3400         | 3304         | 3174         | 2984         | 2934         | 2744         | 2762         | 2700         | 260          | 194          | 0            | 0            | 0            | 0            | 0            |
| Total Demand                         | 25260        | 26943        | 24520        | 24404        | 24264        | 24054        | 23994        | 23784        | 23782        | 23710        | 21170        | 21154        | 21120        | 20920        | 20890        | 20860        | 20840        |
| <b>TOTAL LOAD</b>                    | <b>25260</b> | <b>26943</b> | <b>24520</b> | <b>24404</b> | <b>24264</b> | <b>24054</b> | <b>23994</b> | <b>23784</b> | <b>23782</b> | <b>23710</b> | <b>21170</b> | <b>21154</b> | <b>21120</b> | <b>20920</b> | <b>20890</b> | <b>20860</b> | <b>20840</b> |
| <b>SURPLUS</b>                       | <b>1383</b>  | <b>1234</b>  | <b>1504</b>  | <b>1619</b>  | <b>2403</b>  | <b>3283</b>  | <b>3625</b>  | <b>2849</b>  | <b>2721</b>  | <b>2473</b>  | <b>4380</b>  | <b>3763</b>  | <b>3181</b>  | <b>2733</b>  | <b>1629</b>  | <b>334</b>   | <b>17</b>    |

**TABLE A**  
**DEPENDABLE ENERGY (GWh): BASE MANITOBA LOAD FORECAST**  
**Supply/Demand Balance - 2002 FF Sequence**  
 Wind (250 MW) - 2002, Hydro/Coal - 2009, Gas - 2022, SCCT - 2031, SCCT - 2035  
 Resource and Demand at the Generation Level

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| Fiscal Year Beginning April          | 2022/23      | 2023/24      | 2024/25      | 2025/26      | 2026/27      | 2027/28      | 2028/29      | 2029/30      | 2030/31      | 2031/32      | 2032/33      | 2033/34      | 2034/35      | 2035/36      | 2036/37      | 2037/38      |
|--------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Power Resources</b>               |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| <b>Manitoba Hydroelectric Plants</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Kaduna-Melton, MB Load               | 20830        | 20840        | 20870        | 20900        | 20900        | 20900        | 20940        | 20940        | 20930        | 20930        | 20920        | 20910        | 20910        | 20900        | 20890        | 20880        |
| WUSKWAHIA                            | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         | 1260         |
| Duck                                 | 1871         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         | 2800         |
| <b>500 MW HVDC Boreal B</b>          | 337          | 380          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          | 384          |
| <b>Manitoba Thermal Plants</b>       |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Manitowish S. Nuclear Review         | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| Dakota Nuclear Review                | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| Manitowish S. FUEL                   | 2280         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         | 2380         |
| SCCT A                               | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 1100         | 1100         | 1100         | 1100         | 2200         | 2200         | 2200         |
| <b>Wind</b>                          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          | 717          |
| <b>Demand Side Management</b>        | 623          | 610          | 605          | 600          | 646          | 633          | 635          | 627          | 631          | 631          | 631          | 631          | 631          | 631          | 631          | 631          |
| <b>Water Rerouting</b>               |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| Water Rerouting                      | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| <b>Imports</b>                       | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         | 1430         |
| <b>TOTAL POWER RESOURCES</b>         | <b>28719</b> | <b>30173</b> | <b>30285</b> | <b>30361</b> | <b>30358</b> | <b>30314</b> | <b>29997</b> | <b>29969</b> | <b>29992</b> | <b>31092</b> | <b>31092</b> | <b>31072</b> | <b>31072</b> | <b>32180</b> | <b>32180</b> | <b>32180</b> |
| <b>Demand</b>                        |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| 500 B Line Load                      | 21951        | 21990        | 22070        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        | 22100        |
| Dakota                               | 2            | 3            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| Dakota (200 MW Load)                 | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            | 0            |
| <b>TOTAL DEMAND</b>                  | <b>21953</b> | <b>21993</b> | <b>22070</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> | <b>22100</b> |
| <b>SURPLUS</b>                       | <b>1067</b>  | <b>2281</b>  | <b>1915</b>  | <b>1861</b>  | <b>1828</b>  | <b>1814</b>  | <b>1789</b>  | <b>1769</b>  | <b>1792</b>  | <b>1899</b>  | <b>1892</b>  | <b>1892</b>  | <b>1892</b>  | <b>2008</b>  | <b>2080</b>  | <b>2080</b>  |

**TABLE 6**  
**ANNUAL PEAK CAPACITY (MW) BASE MANITOBA LOAD FORECAST**  
**Supply/Demand Balance - TMS #7 Sequence**  
 Wind (250 MW), 2005 Hydroplan, 2009 Sub, 2012, SUCT, 2015, SUCT, 2016  
 Resource and Demand at the Generation Level

Page 1 of 2

| Forecast Year Beginning April        | 2005/06     | 2006/07     | 2007/08     | 2008/09     | 2009/10     | 2010/11     | 2011/12     | 2012/13     | 2013/14     | 2014/15     | 2015/16     | 2016/17     | 2017/18     | 2018/19     | 2019/20     | 2020/21     | 2021/22     |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Power Resources</b>               |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>Manitoba Hydroelectric Plants</b> |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Gravel                               | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         |
| Kesteven Dam                         | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| Gravel                               | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| <b>500 MW HVDC Spots 16</b>          | 0           | 0           | 0           | 0           | 0           | 36          | 66          | 68          | 69          | 65          | 66          | 68          | 66          | 66          | 66          | 66          | 66          |
| <b>Manitoba Thermal Plants</b>       |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Brandon Unit 5 (Lignite Reserve)     | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 108         | 0           | 0           | 0           |
| Selkirk Central Reserve              | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 132         | 0           | 0           |
| Brandon Units 6-7 SUCT               | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         | 290         |
| SUCTs                                | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| <b>Wind</b>                          | 11          | 17          | 22          | 28          | 35          | 39          | 43          | 46          | 48          | 49          | 50          | 51          | 52          | 53          | 54          | 55          | 56          |
| <b>Demand Side Management</b>        | 56          | 56          | 79          | 80          | 98          | 100         | 117         | 123         | 120         | 120         | 143         | 140         | 158         | 161         | 167         | 172         | 171         |
| <b>Major Reuniting</b>               |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Wabigoon Reuniting                   | 11          | 21          | 23          | 43          | 64          | 64          | 76          | 76          | 75          | 75          | 75          | 76          | 76          | 76          | 76          | 76          | 76          |
| <b>Imports</b>                       |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Twin Falls Gas                       | 550         | 550         | 550         | 550         | 550         | 550         | 550         | 550         | 550         | 550         | 550         | 440         | 440         | 220         | 0           | 0           | 0           |
| <b>TOTAL POWER RESOURCES</b>         | <b>1591</b> | <b>1619</b> | <b>1645</b> | <b>1673</b> | <b>1703</b> | <b>1739</b> | <b>1783</b> | <b>1829</b> | <b>1832</b> | <b>1835</b> | <b>1836</b> | <b>1837</b> | <b>1837</b> | <b>1837</b> | <b>1837</b> | <b>1837</b> | <b>1837</b> |
| <b>Peak Demand</b>                   |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| 2000 Base Load                       | 4000        | 4125        | 4180        | 4180        | 4215        | 4238        | 4295        | 4318        | 4335        | 4377        | 4418        | 4470        | 4525        | 4580        | 4635        | 4690        | 4745        |
| Exports                              | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         |
| Load Transfer (LDR)                  | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         | 400         |
| <b>Peak Load</b>                     | <b>4800</b> | <b>4925</b> | <b>4980</b> | <b>4980</b> | <b>5015</b> | <b>5038</b> | <b>5095</b> | <b>5118</b> | <b>5135</b> | <b>5177</b> | <b>5218</b> | <b>5270</b> | <b>5325</b> | <b>5380</b> | <b>5435</b> | <b>5490</b> | <b>5545</b> |
| <b>Reserve</b>                       | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  | <b>400</b>  |
| <b>TOTAL DEMAND</b>                  | <b>5200</b> | <b>5325</b> | <b>5380</b> | <b>5380</b> | <b>5415</b> | <b>5438</b> | <b>5495</b> | <b>5518</b> | <b>5535</b> | <b>5577</b> | <b>5618</b> | <b>5670</b> | <b>5725</b> | <b>5780</b> | <b>5835</b> | <b>5890</b> | <b>5945</b> |
| <b>SURPLUS</b>                       | <b>791</b>  | <b>794</b>  | <b>765</b>  | <b>763</b>  | <b>688</b>  | <b>699</b>  | <b>634</b>  | <b>611</b>  | <b>602</b>  | <b>585</b>  | <b>566</b>  | <b>547</b>  | <b>522</b>  | <b>497</b>  | <b>472</b>  | <b>447</b>  | <b>422</b>  |

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| Place Year Beginning April     | 2022/23 | 2023/24 | 2024/25 | 2025/26 | 2026/27 | 2027/28 | 2028/29 | 2029/30 | 2030/31 | 2031/32 | 2032/33 | 2033/34 | 2034/35 | 2035/36 | 2036/37 | 2037/38 |
|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Power Resources                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Manitoba Hydroelectric Plants  |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Existing                       | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    | 4028    |
| WUSHWATIN                      | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     | 200     |
| QUEL                           | 200     | 015     | 018     | 016     | 015     | 016     | 016     | 016     | 015     | 018     | 018     | 016     | 015     | 016     | 016     | 018     |
| 800 MW HYCO Bpole III          | 05      | 05      | 70      | 60      | 05      | 05      | 05      | 05      | 05      | 06      | 06      | 06      | 05      | 06      | 06      | 06      |
| Manitoba Thermal Plants        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Brandon Unit 5 License Renewal | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Brandon License Renewal        | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Brandon Units 5-7 SJLC         | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     | 236     |
| SOCT's                         | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 142     | 142     | 142     | 142     | 204     | 204     | 204     |
| Wind                           | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      | 29      |
| Demand Side Management         | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     | 150     |
| Major Rerunning                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Archie Rerunning               | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      | 75      |
| Imports                        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Total Demand                   | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| TOTAL POWER RESOURCES          | 6891    | 6294    | 6270    | 6264    | 6262    | 6260    | 6259    | 6258    | 6260    | 6402    | 6402    | 6402    | 6402    | 6544    | 6544    | 6544    |
| Peak Demand                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| 1000 Base Load                 | 4734    | 4712    | 4690    | 4680    | 4664    | 4646    | 4630    | 4615    | 4600    | 4574    | 4549    | 4523    | 4498    | 4470    | 4443    | 4416    |
| Exports                        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Peak Customer Base             | 5       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Total Load                     | 4739    | 4712    | 4690    | 4680    | 4664    | 4646    | 4630    | 4615    | 4600    | 4574    | 4549    | 4523    | 4498    | 4470    | 4443    | 4416    |
| Reserve                        | 556     | 572     | 570     | 568     | 566     | 564     | 562     | 560     | 558     | 556     | 554     | 552     | 550     | 548     | 546     | 544     |
| TOTAL DEMAND                   | 5295    | 5285    | 5260    | 5246    | 5230    | 5210    | 5190    | 5175    | 5160    | 5130    | 5099    | 5067    | 5033    | 4998    | 4963    | 4920    |
| SURPLUS                        | 679     | 349     | 886     | 821     | 796     | 718     | 689     | 610     | 570     | 663     | 614     | 564     | 515     | 609     | 569     | 500     |

# 2003 Manitoba Base Load Forecast

Figure 1a

System Firm Energy Demand and Resources - No New Hydro Generation

SelkirkLR-05/06, Wind (250MW)-05/06, Brandon#5LR-06/07, 500kV HVDC Line -2010/11

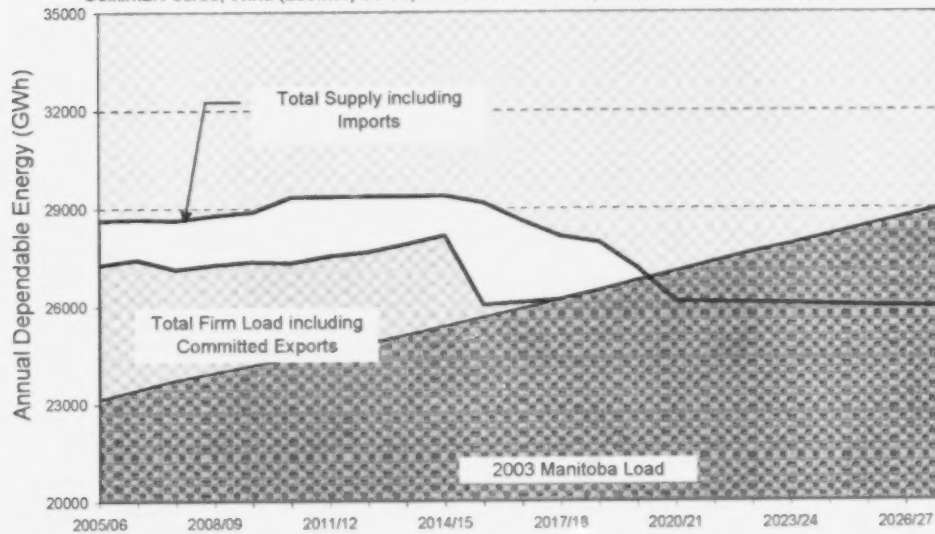
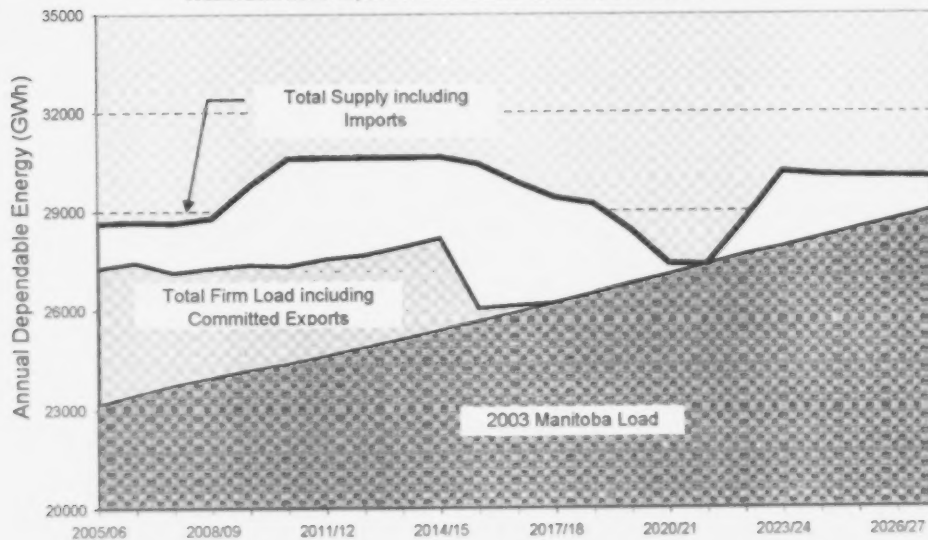


Figure 1b

System Firm Energy Demand and Resources - With New Hydro Generation

SelkirkLR-05/06, Wind (250MW)-05/06, Brandon#5LR-06/07, Wuskwatim-2009/10, 500kV HVDC Line -2010/11, Gull-2022/23



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CCC/NFAAT/S/3

**Request:** CCC requested an assessment of the decrease to Low Export Prices that would be need to have the project breakeven with WACC (6.08%) and Cost of Debt (5.34%)

**Response:** A sensitivity was conducted to determine the extent by which the Low export price forecast would be required to be reduced in order for the internal rate of return (IRR) of the Wuskwatim Project to become equal to:

- the Corporation's Weighted Average Cost of Capital (6.08%)<sup>1</sup> and
- the Corporation's Cost of Debt (5.34%).

This sensitivity was undertaken by reducing the Low export price forecast uniformly over the study period in the scenario where Wuskwatim is advanced from 2020 to 2009 with the objective of achieving the IRR values specified above. The following table summarizes the reductions required to achieve the specific IRR values.

The table also includes an approximation of the natural gas price that would have to occur in the marketplace in order to produce an electricity price that is equivalent to the low export price and the corresponding prices in each of associated breakeven scenarios. CAC/MSOS/NFAAT/S/3 provides additional details on the methodology utilized in determining these equivalent natural gas prices and discusses the likelihood of such prices materializing in the future.

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<sup>1</sup> Manitoba Hydro's real weighted average cost of capital and cost of debt have been revised to 5.98% and 5.25% respectively, slightly less than the 6.08% and 5.34% rates applicable at the time the Wuskwatim evaluation was prepared. An even greater reduction to the low export price forecast, therefore, would be required before the Wuskwatim project would breakeven using the current WACC and cost of debt assumptions.



| Scenario: Low Export Prices                        | Reduction in<br>Export Price from<br>Low | IRR                        | Equivalent natural<br>gas price<br>(\$2002 US/mmBtu) |
|----------------------------------------------------|------------------------------------------|----------------------------|------------------------------------------------------|
| IRR of Advancement Comparison, W-2009<br>vs W-2020 | 0%                                       | 8.5% (Low<br>export price) | ~\$3.10                                              |
| IRR = WACC:                                        | 30%                                      | 6.08%                      | ~\$1.25                                              |
| IRR = Cost of Debt:                                | 35%                                      | 5.34%                      | ~\$0.75                                              |

1  
2 To put the equivalent natural gas prices in the above table into perspective, publicly available  
3 "low" price forecasts for the post-2010 period are significantly higher. The National Energy  
4 Board's recent report entitled "Scenarios for Supply and Demand to 2025" published in July  
5 2003, predicts natural gas prices of US \$3.45 in 2010 with real escalation thereafter in the Supply  
6 Push Scenario (which is the scenario that results in low natural gas prices). The US Energy  
7 Information Administration in its Annual Energy Outlook 2003 predicts in its low economic  
8 growth case (which results in lower natural gas prices), a price of US \$3.18 in 2010, reaching US  
9 \$4.09 (in \$2002) by 2025. Current natural gas prices are approximately US \$4.85 per mmbtu<sup>2</sup>  
10 which reflect the current tight supply situation due, in part, to low natural gas storage levels.

<sup>2</sup> US \$4.85 per mmbtu is the price of Henry Hub natural gas trading on the New York Mercantile Exchange as at July 30, 2003. The  
12 month strip (i.e., September 2003 – August 2004 average) on the same date was US \$4.67/mmbtu.

CCC/NFAAT/S/4  
CAC/MSOS/NFAAT/S/5

**Request:** CCC and CAC/MSOS requested that an IRR sensitivity be conducted on the impact of a drought of record occurring coincident with the advanced in-service date of the project.

**Response:** A sensitivity has been studied to determine the impact on the economics of Wuskwatim advancement under a scenario corresponding to a severe drought of record (1987 to 1992) occurring simultaneously with the 2009 in-service date of Wuskwatim generation. This sensitivity tests the robustness of the decision to advance Wuskwatim under an adverse set of streamflow conditions.

In this analysis, the average of 86 historic flow sequences (1912-1997) is replaced by a system drought of record (1987-1992) occurring coincident with the advanced 2009 in-service date of the project, as shown in the table below. Water flows after the drought period continue in sequence to 1997, which is the end of the flow record. The flow sequence then wraps back around to the first year of record (1912) and continues sequentially to the end of the study period. A system operation simulation model was used to determine the resulting export revenues and production costs while capital costs remain unchanged from those in the average of all flow conditions.

| Wuskwatim ISD | Forecast Year      | Historic Flow Year |
|---------------|--------------------|--------------------|
| Advanced ISD  | 2009               | 1987               |
|               | 2010               | 1988               |
|               | 2011               | 1989               |
|               | 2012               | 1990               |
|               | 2013               | 1991               |
|               | 2014               | 1992               |
|               | 2015               | 1993               |
|               | 2016               | 1994               |
|               | 2017               | 1995               |
|               | 2018               | 1996               |
|               | 2019               | 1997               |
| Base ISD      | 2020               | 1912               |
|               | 2021 to period end | 1913, etc.         |

1 The economic analysis for this drought sensitivity compares Wuskwatim 2020 to Wuskwatim  
2 2009. The drought sequence of water flows causes the net export revenues associated with  
3 Wuskwatim advancement to decrease by an average of about 9% per year during the period of  
4 advancement from 2009 to 2020. This reduction in benefits results in the IRR of Wuskwatim  
5 being reduced from 10.3% to 9.7%. Such a reduction in IRR is well within the range of other  
6 sensitivity analyses, and it is concluded that the project economics are robust under a scenario of  
7 lowest water flows.

- 1 **MH/NCN/NFAAT/S/1**
- 2
- 3 **Social Benefit Cost Analysis – Low and High Export Prices**
- 4
- 5 See attached report prepared by Marvin Shaffer and Associates Ltd. MH/NCN/NFAAT/S/1a

**SOCIAL NET BENEFITS  
OF  
ADVANCING  
THE WUSKWATIM PROJECT**

*Prepared for Manitoba Hydro*

*by*

*Marvin Shaffer & Associates Ltd.*

**August, 2003**

## 1.0 Introduction

In its submission to the Manitoba Clean Environment Commission (*Need for and Alternatives to the Wuskwatim Project*, April 2003), Manitoba Hydro provided an economic analysis that concludes advancing the in-service date for Wuskwatim from 2020 to 2009 for export purposes would yield an attractive rate of return consistent with the low risk it entails.<sup>1</sup> This analysis and estimated return is based on the incremental revenues and expenditures that advancing Wuskwatim would have on Manitoba Hydro. The return is the amount that would be shared by Manitoba Hydro (and its customers) and Nisichawayasihk Cree Nation (NCN) in accordance with their Agreement in Principle for Wuskwatim.

In economic terminology, the economic analysis in Manitoba Hydro's April submission is from a private project perspective. The purpose of this report is to present an evaluation of advancing Wuskwatim from a broader social perspective—to estimate the net benefits taking into account not just the financial return to be shared by Manitoba Hydro, its customers and NCN, but all of the benefits and costs Manitobans would realize or incur as a result of the project.

The project scope, characteristics, advancement period and financial implications assumed in this social benefit-cost evaluation are the same as set out by Manitoba Hydro in its April submission. The evaluation covers both the generation component that would be undertaken by Manitoba Hydro and NCN, and the associated transmission that would be undertaken by Manitoba Hydro.

The starting point for the evaluation is the impact of the project on revenues and expenditures, as in the private analysis. A series of adjustments are then made to move from a private project to social perspective:

- Government transfers- Some of the project's expenditures are simply transfers to government. Most significantly, there are water rentals and capital taxes paid to government, neither of which reflect nor are intended to offset real resource or other costs caused by the project. These transfers to government are recognized as a benefit to taxpayers.
- Other transfers- Included in Wuskwatim-related transmission costs are the expenditures that Manitoba Hydro would incur to create a fund for the benefit of aboriginal communities whose traditional lands would be traversed by the transmission line required for the project. Since the impacts of the line are expected to be minimized in routing and other mitigative measures, the real resource costs are likely to be small.<sup>2</sup> The fund is therefore recognized as a benefit to the recipient communities.
- Employment and other income impacts- In the private project evaluation, all wages and payments to contractors are treated as costs. However, to the extent

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<sup>1</sup> The internal real (inflation-adjusted) rate of return under the expected export price forecast is estimated at 10.3%, and 8.0% and 12.1% under low and high price forecasts respectively.

<sup>2</sup> April 2003 submission, *Integrated Executive Summary of Environmental Impact Statements*, p.27.

these wages and other payments exceed what the recipient Manitobans would otherwise have earned (for example, any wages paid to workers who would otherwise be unemployed or underemployed), they constitute a benefit and are recognized as such in the social evaluation. On the other hand, there are expenditures that the project and the government would incur to upgrade education and provide training in order to increase the employment of nearby and other northern aboriginal residents. These expenditures, less whatever long term (post-Wuskwatim) benefit the education and training provides, are recognized as social costs, serving to reduce the net income benefit.

- Environmental and social impacts- Adverse environmental impacts from the construction and operation of Wuskwatim are expected to be minimal due to the low head design and relatively small amount of flooding it would entail. Also, because of the environmentally sensitive project design and the partnership agreement Manitoba Hydro has entered into with NCN, adverse social impacts are expected to be small. If there were any uncompensated residual impacts they would have had to be recognized as costs of the project. On the positive side, generation of power from Wuskwatim would displace thermal power production in the export market and consequently reduce greenhouse gas (GHG) as well as local air emissions. The GHG reductions benefit Manitobans wherever they occur. In the expected and high export price scenarios, the benefit of GHG reductions is reflected in the forecast prices. No further adjustment is required. However, no environmental premium is captured in the low export price scenario and in this case, the value of the GHG reductions are included as a social benefit.

The private project impacts and social adjustments are expressed in annual dollar terms. The overall net benefit is calculated by discounting future values to an equivalent present value. The discount rate generally used in social benefit-cost analysis is a weighted average social opportunity cost of capital—reflecting what investment, if any, is foregone and additional foreign borrowing or saving induced as a result of the project. A range of 6% to 8% real is used in this evaluation, with the lower end more appropriate the more that the project simply results in more borrowing or saving—the higher end more appropriate the more that investment in Wuskwatim displaces other investment in Manitoba.<sup>3</sup>

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<sup>3</sup> Seminal research on the social opportunity cost of capital (SOCC) in Canada was undertaken by Professors Glenn Jenkins and David Burgess in the 1970s and early 1980s. At that time Jenkins' research suggested the SOCC was approximately 10% real. Burgess, who argued that capital requirements are met more by foreign borrowing and less by displacing other investment, suggested the SOCC was approximately 7% real. In their recent text (*Cost-Benefit Analysis, Concepts and Practice*, 2001), Boardman et.al. note that prescribed discount rates in North American jurisdictions have tended lower in recent years. British Columbia Crown Corporations, including BC Hydro, use a rate of 8% real. The U.S. Office of Management and Budget revised the rate it requires for all executive agency benefit-cost analyses from 10% to 7% real. Boardman et. al. also note that the sources of capital as estimated by Jenkins and Burgess would currently imply SOCCs of 7% and 5% respectively, based on estimated social costs of each source.

## 2.0 Private Project Net Benefits

There are three broad financial impacts that would result from advancing the in-service date of Wuskwatim from 2020 to 2009. Capital expenditures for the project would be advanced, with the bulk of expenditures being made over the 2004-2008 period as compared to 2015-2019. There would be additional O&M expenditures, including water rental and capital taxes, incurred over the 2009-2020 period. And there would be additional export revenues over the 2009-2020 period because of the additional generating capacity Wuskwatim provides.

In Table 1, the 2002 present values of these impacts and overall net effect are shown for three export price scenarios: low and high price scenarios which are likely to bracket the range of possible outcomes, and an expected price scenario which, as explained in Manitoba Hydro's April submission, incorporates on a probabilistic basis some environmental premium for hydro power on top of a reference export price forecast. The present values are expressed in millions of 2002 Cdn \$ and calculated at 6% and 8% real discount rates.

**Table 1 – Financial Impacts of the Project**

(2002 NPV, \$million Cdn)

| Discount Rate | Incremental Capital Expenditures <sup>4</sup> | Incremental O&M (Including taxes) | Incremental Export Revenue |          |        | Private Net Benefits |          |        |
|---------------|-----------------------------------------------|-----------------------------------|----------------------------|----------|--------|----------------------|----------|--------|
|               |                                               |                                   | Low                        | Expected | High   | Low                  | Expected | High   |
| 6%            | 217.31                                        | 58.51                             | 385.17                     | 479.98   | 593.01 | 109.34               | 204.15   | 317.18 |
| 8%            | 242.97                                        | 48.49                             | 309.59                     | 384.19   | 475.05 | 18.11                | 92.71    | 183.57 |

As shown in the table, advancing Wuskwatim would have significant financial private net benefits, ranging from \$109 to \$317 million at a 6% discount rate and \$18 to \$184 million at an 8% discount rate. As with most capital intensive projects, the lower the discount rate, in other words, the lower the assumed opportunity cost of capital, the markedly greater are the net benefits.

<sup>4</sup> Incremental capital expenditures reflect the difference in the present value of the generation and transmission capital expenditures for the 2009 and 2020 in-service dates, net of the present values of the residual value of the assets at the end of the planning period in each case.



### 3.0 Social Adjustments

#### 3.1 Government Transfers

Over three quarters of the incremental O&M expenditures the project would incur as a result of advancing Wuskwatim are transfers to government. As shown in Table 2 below, the present value of the incremental water rentals and capital taxes total \$46 million at a 6% discount rate, \$38 million at an 8% discount rate. These are benefits to Manitoba taxpayers.

Table 2 - Government Transfers

(2002 NPV, \$million Cdn)

| <i>Discount Rate</i> | <i>Incremental Water Rentals</i> | <i>Incremental Capital Taxes</i> | <i>Total Incremental Government Transfers</i> |
|----------------------|----------------------------------|----------------------------------|-----------------------------------------------|
| 6%                   | 27.70                            | 17.92                            | 45.62                                         |
| 8%                   | 22.28                            | 15.80                            | 38.08                                         |

There are as well other tax revenues that would be directly and indirectly generated by the expenditures for the construction and operation of Wuskwatim. For example, all of the materials used to construct the project, except for power generation equipment, are subject to provincial sales tax. There are fuel, income and other taxes that would be paid. The economic impact assessment provided in the April submission indicates that the provincial tax impact from construction could total over \$55 million. The present value benefit from advancing those tax payments would be significant. However, much of this tax impact is from income taxes and incremental income benefits (including the portion taxed by government) are estimated in section 3.3 below. They are therefore not included here. Also, the extent to which the sales, fuel and other such tax impacts increase transfers to the government depends on the extent to which the project-related purchases give rise to more production and sales of those goods as opposed to diverting the taxed goods from other users. The actual increase in tax revenues would be less than the gross impact estimates. What the net impact would be is highly uncertain and not included in the estimated benefits from the project.

#### 3.2 Other Transfers

Manitoba Hydro is planning to contribute over \$5 million to a fund for the benefit of aboriginal communities whose traditional lands would be traversed by the transmission line required for Wuskwatim. The earlier contribution due to the advancement of Wuskwatim would benefit the recipient communities. The increase in the 2002 present value of the contribution is \$1.8 million at a 6% discount rate and \$1.9 million at an 8% discount rate.

### 3.3 Employment and Other Income Impacts

The construction of Wuskwatim would directly generate an estimated 2200 person years (PYs) of employment. It is estimated that over 1800 of the PYs would go to Manitobans and of those over 700 would go to Northern Manitobans. The earnings and benefits per PY would average \$110,000. The total income from this employment would be approximately \$200 million (in 2002\$), representing 38% of the total capital cost.

The extent to which this income constitutes a social benefit depends on two factors: 1) the percentage of the workers who would otherwise be unemployed and 2) for those who would otherwise be employed, the difference between the average income that would be earned at Wuskwatim and the average income that would be earned elsewhere.

Unemployment rates in Manitoba are at low levels, averaging 5.0% over the past three years.<sup>5</sup> However, the provincial rate masks important regional and occupational differences. Unemployment is significantly higher in northern Manitoba, especially in aboriginal communities. It is also high for a number of non-designated trades.<sup>6</sup> It is likely that many of the persons hired from these northern communities and for non-designated trades would otherwise be un- or underemployed.

On the other hand, based on current relatively low unemployment rates, it is likely that a large percentage of the designated trade workers, particularly from southern Manitoba, would otherwise be employed. They would still benefit (though to a lesser extent than those who would otherwise be unemployed) because their incomes at Wuskwatim would exceed what they could otherwise have earned. It is the higher income that would attract them to the jobs.

It is impossible to determine precisely what percentage of northern (or other) Manitoban workers would otherwise be unemployed and to what extent the average incomes at Wuskwatim exceed the incomes that would have been earned by workers attracted from other jobs. However, to illustrate the order of magnitude of the social benefit from the construction employment it is assumed that 20% of the income earned at Wuskwatim would be by workers who would otherwise be unemployed, based on the approximate proportion of the construction workforce accounted for by high unemployment non-designated trades. It is also assumed that the incomes earned by workers attracted from other jobs would be at least 10% higher than what they would have earned elsewhere. Under these assumptions, 28% of the labour income earned at Wuskwatim would be a social benefit. That would be the incremental earnings due to the project. The present value increase in this social benefit resulting from the advancement of Wuskwatim would be \$20.5 million at a 6% discount rate and \$24.4 million at an 8% discount rate.

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<sup>5</sup> Source: Statistics Canada 71-001

<sup>6</sup> For example, the estimated unemployment rates for labourers and heavy equipment operators, which together account for some 20% of the peak workforce, were 25.8% and 10.9% respectively in June, 2003 (based on EI claimant data).

Operations and maintenance at Wuskwatim would require approximately 6 full time equivalent jobs, generating employment income of some \$460,000 per year. On the assumption that the persons filling these positions would be attracted or promoted from other jobs, with average incomes at least 10% greater than what the persons hired would otherwise have earned, there would be a social benefit of at least 10% of the total O&M earnings. At 10%, the net present value benefit from advancing Wuskwatim would be \$.26 million at a 6% discount rate \$.21 million at an 8% discount rate.

Educational upgrade and training costs that the project and the federal and provincial governments would incur are estimated to total \$15 million. The increase in the present value cost of advancing these expenditures would be \$5.4 million at a 6% discount rate and \$6.2 million at an 8% discount rate. Education and training are expected to provide benefits well beyond the work at Wuskwatim. The enhanced employability should increase the life-time earnings for the persons trained. However, even if one assigns all of these educational and training costs to the Wuskwatim project, it would still leave a net employment benefit of \$15.4 million at a 6% rate and \$18.4 million at an 8% discount rate, as shown in Table 3 below.<sup>7</sup>

These net employment benefit estimates should not be considered precise. As noted earlier they are meant only to be illustrative of the order of magnitude of the social benefits from the advancement of employment and training for Wuskwatim. The key point is that they are significant even if understated in the table due to the conservative assumptions employed.

**Table 3 – Employment Benefits**

(2002 NPV, \$million Cdn)

| <i>Discount Rate</i> | <i>Incremental Construction Income</i> | <i>Incremental O&amp;M Income</i> | <i>Training and Educational Upgrade Costs</i> | <i>Net Employment Benefits</i> |
|----------------------|----------------------------------------|-----------------------------------|-----------------------------------------------|--------------------------------|
| 6%                   | 20.54                                  | .26                               | (5.41)                                        | 15.39                          |
| 8%                   | 24.38                                  | .21                               | (6.17)                                        | 18.41                          |

### 3.4 Environmental and Social Impacts

Wuskwatim has been designed to be a low impact project. The low head design would result in limited flooding, the operating plan would serve to stabilize water levels on Wuskwatim Lake and limit downstream water level and flow changes, and Manitoba Hydro and NCN are committed to an environmental protection plan to avoid adverse effects.<sup>8</sup> The environmental review concluded that no significant residual adverse effects

<sup>7</sup> A significant proportion of the education and training funds are expected to be provided by the federal government. This is still included as a cost to Manitobans on the assumption that these expenditures would reduce federal spending on other initiatives in the province.

<sup>8</sup> April 2003 submission, *Integrated Executive Summary of Environmental Impact Statements*, p.18.

are expected and there may even be improvement in harvesting and other resource use because of the improved access the project provides.

Wuskwatim is expected to have a positive impact on GHG emissions. The advancement of Wuskwatim for export purposes would mean that the purchasing utilities would not have to acquire the equivalent amount of power from other sources. The most likely alternative sources are thermal, and even if Wuskwatim were to displace efficient natural gas-fired combined cycle power, it would reduce GHG emissions by some 500 tons of CO<sub>2</sub>/GWh.<sup>9</sup> If Wuskwatim were to displace power production from coal plants, the GHG reductions would be greater.

In the expected and high price forecasts, the value of the GHG emission impact is captured in the export price. It is assumed in those forecasts that the purchasers would pay a premium for hydro power because of the offset or other obligations they would have with higher emitting alternative sources of power. Consequently, no social adjustment is required. The low forecast, on the other hand, assumes that the export price does not capture any environmental benefit. However, even if Manitoba Hydro and NCN do not capture the value in their export revenues, there still would be a benefit to Manitobans from the GHG impact. GHG-related damages or offset costs would be avoided. There is a wide range of damage or offset cost estimates for GHGs. A low end of the range suggested in Canadian Kyoto implementation studies is \$10 Cdn/ton.<sup>10</sup> This would suggest a benefit for Wuskwatim of at least \$5Cdn/MWh, or roughly 10% of the assumed low export price<sup>11</sup>. On that basis, the present value GHG benefit of advancing Wuskwatim would be \$38.5 million at a 6% discount rate; \$31.0 million at an 8% discount rate. These are included as social benefits in the low export price scenario.

#### 4.0 Overall Social Net Benefits

Table 4 below summarizes all of the estimated adjustments required to move from a private project to social perspective. The total is in the order of \$89 to \$101 million in the low price scenario and \$58-63 million in the expected and high price scenarios. The expected and high scenarios still offer greater overall benefits; it is just that the social *adjustments* are less in the expected and high price scenarios because the benefit of GHG reductions is assumed to be already captured in Manitoba Hydro's export price. The single most significant adjustment is for the water rental and capital tax transfers to government—costs from the perspective of the project, but benefits from the point of

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<sup>9</sup> Pembina Institute, *Life Cycle Evaluation of GHG Emissions and Land Change Related to Selected Power Generation Options in Manitoba*, Feb. 25, 2003.

<sup>10</sup> The low carbon price suggested in Manitoba Hydro's April submission is \$10US/ton.

<sup>11</sup> The \$5/MWh assumes that Wuskwatim displaces new combined cycle gas generation and thereby reduces GHG emissions by 500 tons of CO<sub>2</sub>/GWh. If the low export prices were the result of widespread continuing use of coal plants in the U.S., the GHG benefit from Wuskwatim would be even greater. Instead of displacing combined cycle gas plants, the export from Wuskwatim might displace coal generation, a source with some two times the GHG emissions per GWh than combined cycle gas.

view of Manitoba taxpayers. The adjustment for employment benefits is also significant even with the conservative assumptions employed to develop these illustrative estimates.

**Table 4 – Social Adjustments**

| <i>Social Adjustment</i>                         | <i>Basis for Estimate</i>                          | <i>Major Factors/Assumptions</i>                                                                                                       | <i>Beneficiaries</i>                                             | <i>NPV@ 6% (\$million Cdn)</i> | <i>NPV@8% (\$million Cdn)</i> |
|--------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------|-------------------------------|
| <i>Government Transfers</i>                      | Incremental taxes to provincial government         | Includes water rentals and capital taxes<br>Provincial sales tax impact not included                                                   | Manitoba taxpayers                                               | 45.62                          | 38.09                         |
| <i>Other Transfers</i>                           | Transmission development fund                      | Fund is to provide net benefit; adverse impacts mitigated or otherwise addressed                                                       | Aboriginal communities whose traditional lands traversed by line | 1.8                            | 1.9                           |
| <i>Net Employment</i>                            | Incremental income less training and upgrade costs | Illustrative conservative assumptions re: percentage of workers otherwise unemployed; wage premium and on-going benefits from training | Workers hired in construction and O&M                            | 15.39                          | 18.41                         |
| <i>GHG Emission Reduction</i>                    | Value of GHG emission reductions                   | Wuskwatim displaces combined cycle power; benefit \$10/tonne of CO <sub>2e</sub> ; benefit not captured in low export price scenario   | Global                                                           | 38.52                          | 30.96                         |
| <i>Total-Low Export Price Scenario</i>           |                                                    |                                                                                                                                        |                                                                  | <b>101.33</b>                  | <b>89.34</b>                  |
| <i>Total-Expected/High Export Price Scenario</i> |                                                    |                                                                                                                                        |                                                                  | <b>62.81</b>                   | <b>58.38</b>                  |

In Table 5 the social adjustments are added to the private net benefits to show the estimated overall social net benefits from advancing Wuskwatim. The estimated total social net benefits range from \$210 to \$380 million at a 6% discount rate and \$107 to \$242 million at an 8% discount rate. The impact of the social adjustments is most noticeable in the low price scenario, but in all cases the estimated social net benefits significantly exceed the private project net benefits. In addition to the project benefits that

Manitoba Hydro, its customers and its partner NCN would share, there are benefits that would accrue to taxpayers, aboriginal communities, workers and the global environment.

**Table 5 - Overall Social Net Benefits**

(2002 NPV, \$million Cdn)

| <i>Discount<br/>Rate</i> | <i>Private Net Benefits</i> |             |             | <i>Social<br/>Adjustments</i> |                      | <i>Overall Social Net Benefits</i> |                 |             |
|--------------------------|-----------------------------|-------------|-------------|-------------------------------|----------------------|------------------------------------|-----------------|-------------|
|                          | <i>Low</i>                  | <i>Exp.</i> | <i>High</i> | <i>Low</i>                    | <i>Exp/<br/>High</i> | <i>Low</i>                         | <i>Expected</i> | <i>High</i> |
| 6%                       | 109.34                      | 204.15      | 317.18      | 101.3                         | 62.81                | 210.67                             | 266.96          | 379.99      |
| 8%                       | 18.11                       | 92.71       | 183.57      | 89.34                         | 58.38                | 107.46                             | 151.11          | 241.96      |



CAC/MSOS/NFAAT/S/6

**Request:** CAC requested that a sensitivity be performed on Wuskwatim Project Economics to:  
Development of Twice the Current Forecast for DSM; 250 MW Wind; a combination of these  
two sensitivities.

**Response:** A set of sensitivities were conducted to determine the impact on the internal rate of  
return (IRR) of the Wuskwatim Project if additional surplus energy and capacity was available to  
the system for export through:

- Double the size of Demand Side Management (DSM)
- 250 MW of wind generation
- Combining these two sensitivities

These sensitivities examine the individual and combined extent to which the IRR would decline  
for the Wuskwatim Project through the advancement period of 2009 to 2020, if the output of  
Wuskwatim would be required to compete for interconnection space and export market share  
with additional system surplus energy and capacity from wind and/or additional DSM.

For the DSM sensitivity, the DSM was doubled from current projected forecast throughout the  
study period. This increase in incremental DSM for the year 2015/16 for example, would be 322  
MW/ 1230 GWH in this sensitivity versus 161 MW/ 615 GWH which was included in the base  
evaluation. For the wind sensitivity wind generation was assumed to be 250 MW with a 35%  
capacity factor, in-service date of 2009 and assumed to continue to be in place through to the end  
of the study period. Both sensitivities have the effect of increasing Manitoba Hydro's surplus  
capacity & energy available for export and are assumed to be developed or committed before  
Wuskwatim.

- 1 The following table shows the results of the impact these individual sensitivities have on the IRR
- 2 of the Wuskwatim project as well as the combined effect. It is important to note that even the
- 3 combined effect of these sensitivities still only results in a 0.1% drop in IRR.

| Scenario                                             | IRR    |
|------------------------------------------------------|--------|
| IRR of Base Advancement Comparison, W-2009 vs W-2020 | 10.3%  |
| Impact on IRR of Doubling DSM Sensitivity:           | -0.05% |
| Impact on IRR of 250 MW of Wind Sensitivity:         | -0.05% |
| DSM and addition of 250 MW of wind generation:       | -0.1%  |
| IRR of resulting combined sensitivity:               | 10.2%  |



**MH/NCN/NFAAT/S/2**

**Summary of Economic Evaluations and Sensitivities**

Sensitivity analysis provides a means to examine the vulnerability of a project to deviations to key specific assumptions. This section summarizes and integrates the economic sensitivities for the Wuskwatim project, including those already reported in Table 6.5 of the main submission (labeled A through P), as well as additional economic sensitivities now filed in this supplemental submission (labeled Q through Z). This information is intended to demonstrate the broad range of conditions under which the Wuskwatim Project economics have been tested and proven to be robust. This integration is not a response to a specific request.

See attached (MH/NCN/NFAAT/S/2a)

**TABLE S6.5  
WUSKWATIM PROJECT SENSITIVITY ANALYSIS**

| Sequence Assumption                                                            |                                                                                                                  | IRR (Real)    | Difference from "A" |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|---------------------|
| <b>A.</b>                                                                      | <b>Wuskwatim Long-Term Economics – Expected Export Prices</b>                                                    | <b>10.3%</b>  |                     |
| <b>B.</b>                                                                      | <b>Wuskwatim Advancement (2009 vs. 2020) – Expected Export Prices</b>                                            | <b>10.3%</b>  |                     |
| <b>Low and High Export Price Forecasts</b>                                     |                                                                                                                  |               |                     |
| <b>C.</b>                                                                      | <b>LOW Export Price Forecast</b>                                                                                 | <b>8.0%</b>   | <b>-2.4%</b>        |
| <b>D.</b>                                                                      | <b>HIGH Export Price Forecast</b>                                                                                | <b>12.1%</b>  | <b>1.8%</b>         |
| <b>Reference and Environmental Export Price Forecasts</b>                      |                                                                                                                  |               |                     |
| <b>E.</b>                                                                      | <b>Reference Forecast (No Environmental Export Premium)</b>                                                      | <b>9.2%</b>   | <b>-1.1%</b>        |
| <b>F.</b>                                                                      | <b>LOW Environmental Export Premium Forecast</b>                                                                 | <b>10.2%</b>  | <b>-0.1%</b>        |
| <b>G.</b>                                                                      | <b>MEDIUM Environmental Export Premium Forecast</b>                                                              | <b>10.9%</b>  | <b>0.5%</b>         |
| <b>H.</b>                                                                      | <b>HIGH Environmental Export Premium Forecast</b>                                                                | <b>11.4%</b>  | <b>1.1%</b>         |
| <b>Sensitivities to Wuskwatim Long-Term Economics – Expected Export Prices</b> |                                                                                                                  |               |                     |
| <b>I.</b>                                                                      | <b>Capital Cost INCREASE of 15% (\$95 million)</b>                                                               | <b>9.2%</b>   | <b>-1.1%</b>        |
| <b>J.</b>                                                                      | <b>Capital Cost DECREASE of 15% (\$95 million)</b>                                                               | <b>11.7%</b>  | <b>1.4%</b>         |
| <b>K.</b>                                                                      | <b>10% Flow Reduction on the Burntwood River at Wuskwatim</b>                                                    | <b>9.8%</b>   | <b>-0.5%</b>        |
| <b>L.</b>                                                                      | <b>+300 MW Interconnection Capability Adjustment</b>                                                             | <b>10.5%</b>  | <b>0.2%</b>         |
| <b>M.</b>                                                                      | <b>-300 MW Interconnection Capability Adjustment</b>                                                             | <b>10.0%</b>  | <b>-0.3%</b>        |
| <b>N.</b>                                                                      | <b>Wuskwatim 2010 ISD with added Costs during delay (NPV cost of \$28.4 million, 2002 present value dollars)</b> | <b>10.2%</b>  | <b>-0.1%</b>        |
| Sequence Assumption                                                            |                                                                                                                  | IRR (Real)    | Difference from "B" |
| <b>B.</b>                                                                      | <b>Wuskwatim Advancement (2009 vs. 2020) – Expected Export Prices</b>                                            | <b>10.3%</b>  |                     |
| <b>Low and High Export Price Forecasts</b>                                     |                                                                                                                  |               |                     |
| <b>O.</b>                                                                      | <b>LOW Export Price Forecast</b>                                                                                 | <b>8.5%</b>   | <b>-1.8%</b>        |
| <b>P.</b>                                                                      | <b>HIGH Export Price Forecast</b>                                                                                | <b>12.3%</b>  | <b>2.0%</b>         |
| <b>Reference and Environmental Export Price Forecasts</b>                      |                                                                                                                  |               |                     |
| <b>Q.</b>                                                                      | <b>Reference Forecast (No Environmental Export Premium)</b>                                                      | <b>9.6%</b>   | <b>-0.7%</b>        |
| <b>R.</b>                                                                      | <b>LOW Environmental Export Premium Forecast</b>                                                                 | <b>10.4%</b>  | <b>0.1%</b>         |
| <b>S.</b>                                                                      | <b>MEDIUM Environmental Export Premium Forecast</b>                                                              | <b>11.0%</b>  | <b>0.7%</b>         |
| <b>T.</b>                                                                      | <b>HIGH Environmental Export Premium Forecast</b>                                                                | <b>11.5%</b>  | <b>1.2%</b>         |
| <b>Sensitivities to Wuskwatim Advancement – Expected Export Prices</b>         |                                                                                                                  |               |                     |
| <b>U.</b>                                                                      | <b>Impact of 250 MW of Wind (ISD – 2009)</b>                                                                     | <b>10.25%</b> | <b>-0.05%</b>       |
| <b>V.</b>                                                                      | <b>Impact of increasing (2x) DSM</b>                                                                             | <b>10.25%</b> | <b>-0.05%</b>       |
| <b>W.</b>                                                                      | <b>Combined impact of Wind in 2009 and Increased DSM (ie 250 MW of wind and doubling DSM)</b>                    | <b>10.2%</b>  | <b>-0.1%</b>        |
| <b>X.</b>                                                                      | <b>Impact of System Drought (ie '87 to 91 drought repeating in 2009)</b>                                         | <b>9.7%</b>   | <b>-0.6%</b>        |
| <b>Y.</b>                                                                      | <b>Impact of 2003 Power Resource Plan Update (Wuskwatim Advancement 2009 vs. 2019)</b>                           | <b>10.2%</b>  | <b>-0.1%</b>        |
| <b>Z.</b>                                                                      | <b>Wuskwatim 2010 ISD with added Costs during delay (NPV cost of \$30.8 million, 2002 present value dollars)</b> | <b>10.0%</b>  | <b>-0.3%</b>        |

Note: Inconsistencies in differences are due to rounding.

CCC/NFAAT/S/5  
CAC/MSOS/NFAAT/S/7

**FINANCIAL SENSITIVITY – 5-YEAR LOW WATER FLOW CONDITIONS  
COINCIDING WITH ADVANCED IN-SERVICE**

**Request:** The Crown Corporations Council and CAC/MSOS requested a financial sensitivity to drought.

**Response:** With export sales contributing a third of total electricity sales, Manitoba Hydro's largest predictable financial risk remains that of drought. While the timing of droughts is unknown, history suggests that they will occur on average every 8-10 years. This sensitivity has been formulated, using data and assumptions consistent with **Section CCC/NFAAT/S/4; CAC/MSOS/NFAAT/S/5** of this supplemental filing, to simulate the worst drought on record (1987 to 1992) occurring simultaneously with the in-service of Wuskwatim advanced to 2009. The sensitivity tests the robustness of the decision to advance Wuskwatim under drought conditions rather than the impacts of drought per se on Manitoba Hydro's financial stability.

As in the main submission, the analysis evaluates the year-by-year impacts of advancing Wuskwatim on Manitoba Hydro's profitability, performance on financial targets and cumulative rates charged to customers. In this analysis, the average of 86 historic flow sequences (1912-1997) is replaced by actual flow conditions, with the 1987-1992 drought flows being assumed to occur over the five years 2009/10 to 2013/14 under both the base case (Wuskwatim 2020) and the advanced case (Wuskwatim 2009). Water flows after the drought period are assumed to be identical to those which actually occurred from 1993 to 1997 (1997 marks the end of the historical data currently available in the flow simulation model). Thereafter, flows revert to those experienced in 1912 and subsequent years, continuing sequentially to the end of the financial projections. Export revenues and production costs have been modified accordingly while capital

1 costs remain unchanged. The financial analysis of the drought sensitivity compares Wuskwatim  
2 2020 to Wuskwatim 2009 at expected export prices.  
3  
4 **Figure 1** shows the incremental impact on Manitoba Hydro's net income from the advancement  
5 of Wuskwatim if the Corporation experiences a repeat of the worst drought on record in the early  
6 years of the Project. In all years, net income is higher (\$3 to \$136 million) under drought  
7 conditions if Wuskwatim is advanced from 2020 to 2009. Interest coverage (**Figure 2**) follows a  
8 similar pattern to net income, with the advancement of the Wuskwatim Project resulting in  
9 improvements to the ratios in all but the year prior to in-service.

**Figure 1**

Sensitivity to 5-Year Low Water Flow Conditions  
Coinciding with Advanced In-service  
Impacts of Wuskwatim Advancement on Manitoba Hydro's Net Income

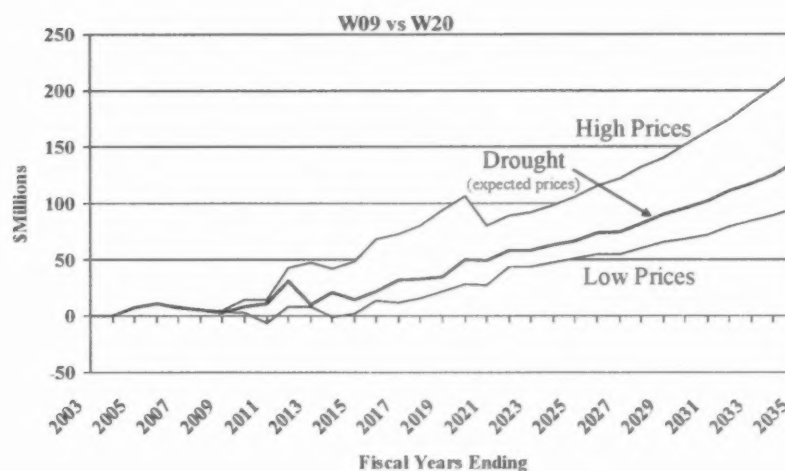
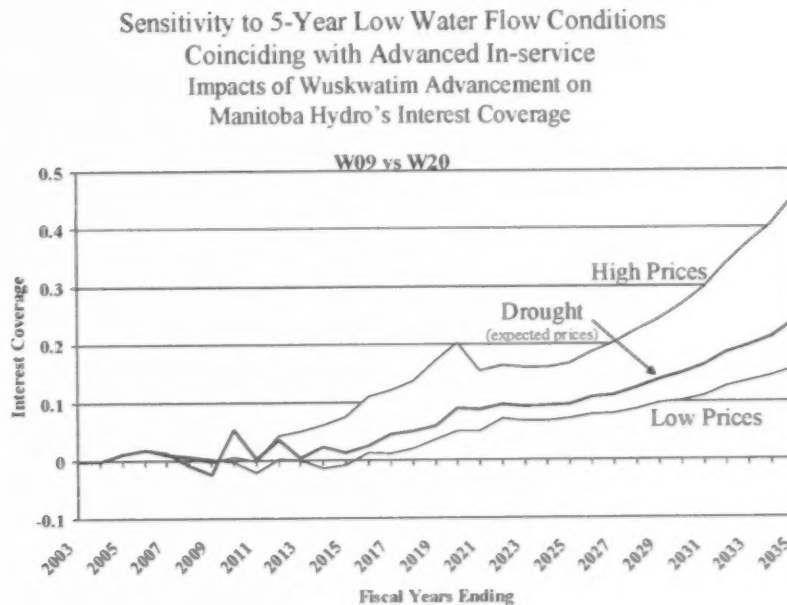


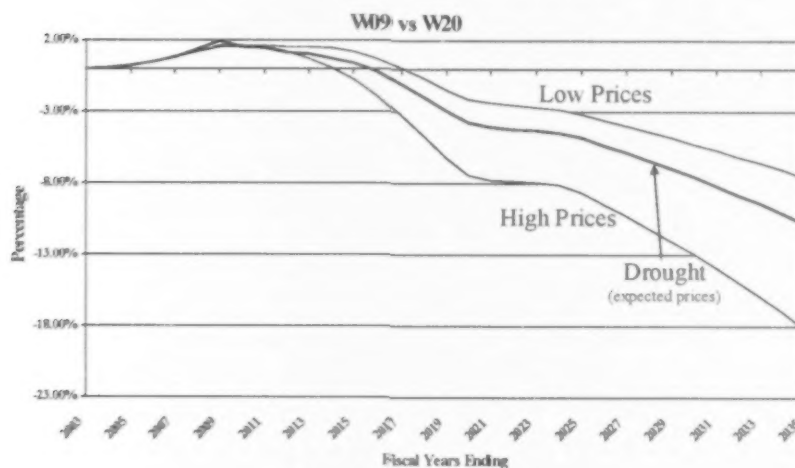
Figure 2



- 1 Although the advancement of Wuskwatim would increase Manitoba Hydro's 2009/10 debt
- 2 levels, this does not, even with low water flow conditions, affect the Corporation's financial
- 3 stability. **Figure 3** shows that Manitoba Hydro's debt ratio under the Wuskwatim 2009 drought
- 4 scenario would increase by no more than 1.9% over the comparable Wuskwatim 2020 case and
- 5 would recover to the same level as the latter case by 2016.

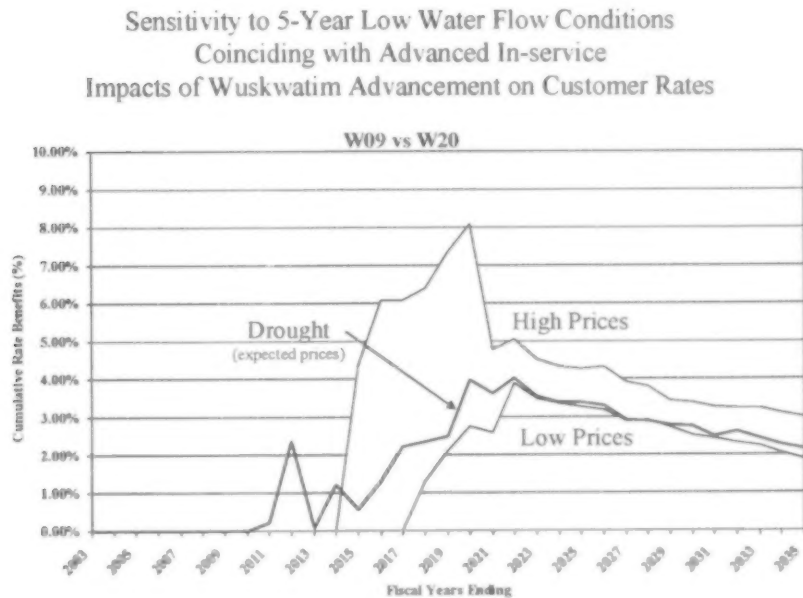
**Figure 3**

Sensitivity to 5-Year Low Water Flow Conditions  
Coinciding with Advanced In-service  
Impacts of Wuskwatim Advancement on Manitoba Hydro's Debt Ratio



1 The potential cumulative percent customer rate benefits and present value of customer bill  
2 benefits are shown in **Figures 4 and 5**. The potential long-term rate savings are derived by  
3 assuming the same rate increases in the Wuskwatim 2009 case as in the 2020 base case, until rate  
4 adjustments are assumed to be made in the 2020 base case in the year following the start of the  
5 drought to recover the losses incurred and maintain the Corporation's financial position. The  
6 long-term rate benefits of advancing Wuskwatim are determined by comparing the 2009 and  
7 2020 cases after this point. In the Wuskwatim 2009 case, rates could be as much as 4% lower  
8 than with a 2020 in-service (2% lower over the long term) even with extended low flow  
9 conditions at the start-up. As stated in the main submission for the high and low price scenarios,  
10 the decline in rate benefits after 2020 reflects that the two sequences are identical beyond that  
11 point. In the advanced case the lower book value and associated carrying costs and the higher net  
12 income during the advancement period result in lower debt levels in the future years.

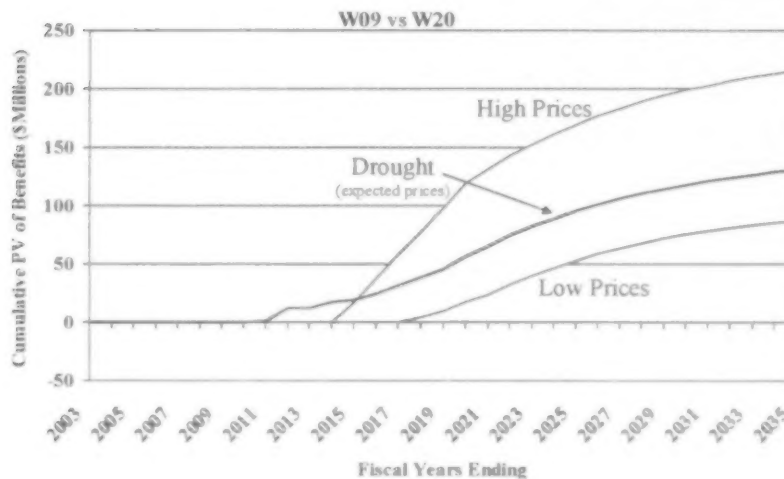
**Figure 4**



- 1 On a present value basis discounted back to 2002, the advancement of the Wuskwatim Project,
- 2 even with drought conditions occurring at start-up, could yield a cumulative reduction of up to
- 3 \$131 million (PV) in the rates that would otherwise be payable by the end of the study period.

**Figure 5**

Sensitivity to 5-Year Low Water Flow Conditions  
Coinciding with Advanced In-service  
Impacts of Wuskwatim Advancement on Customer Bills



1 In summary, the advancement of Wuskwatim to 2009 continues to have a positive impact on  
2 Manitoba Hydro's consolidated financial position even under severe extended low water flow  
3 conditions. Wuskwatim's small initial incremental increase to the Corporation's debt ratio is  
4 projected to have no impact to Manitoba Hydro's financial stability and will not cause rate  
5 increases over and above those required to offset the impacts of drought without Wuskwatim  
6 advanced. The analysis demonstrates that the worst drought on record coinciding with the start-  
7 up of the advanced Wuskwatim falls well within the bounds of the low and high export drought  
8 condition. The advancement of Wuskwatim helps to shield Manitoba Hydro customers from  
9 some of the impacts associated with drought by reducing the amount of costly imports and  
10 thermal generation that would otherwise be required under extended low water flows.



CCC/NFAAT/S/6

**FINANCIAL STABILITY**

**Request:** The Crown Corporations Council requested a further description of the concept of financial stability.

**Response:** The scope of the CEC review is to include assurance that Manitoba Hydro's financial stability will not be negatively affected. Manitoba Hydro interprets "financial stability" as the ability to be financially self-supporting on an ongoing basis while maintaining predictable and reasonable rate increases. For example, credit rating agencies assess the dependence of Crown corporations such as Manitoba Hydro on the Province by determining whether the Crown's financial position and outlook indicate self-supporting status. If so, this debt does not have to be added to that of the Province for credit rating purposes. Financial stability also means the capacity to sustain losses as a normal part of doing business without requiring inordinate rate increases or bailouts from the Corporation's owner. Manitoba Hydro has debt/equity and interest coverage targets which assist the Corporation to absorb financial losses caused by such contingencies as drought, market downturns and facility malfunctioning or accidents. An objective of the CEC review is to gain comfort that the advancement of Wuskwatim and associated increase in debt will not materially enlarge the Corporation's risk of depleting its equity and thereby its financial stability.

August 08, 2003

1 CCC/NFAAT/S/7

2

3 **PROJECTED BALANCE SHEETS & FINANCING REQUIREMENTS STATEMENTS**

4

5 **Request:** The Crown Corporations Council requested projected balance sheets and financing  
6 requirements statements.

7

8 **Response:** See Attachment CCC/NFAAT/S/7a Tables A.21 through A.24.

# ATTACHMENT CCC/NFAAT/S/7a Table: A.21 (cont'd)

Waukegan 2009 Low Price Scenario

## PROJECTED BALANCE SHEET Electric Operations (In Millions of Dollars)

| For year ending March 31           | 2003    | 2004    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    |
|------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>ASSETS</b>                      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Plant in Service                   | 9,462   | 9,894   | 10,308  | 10,633  | 11,067  | 11,342  | 11,710  | 12,972  | 13,571  | 13,862  | 14,121  | 14,778  | 15,273  | 15,776  | 16,290  | 16,796  | 17,279  |
| Accum Depreciation                 | (3,037) | (3,300) | (3,573) | (3,858) | (4,151) | (4,459) | (4,773) | (5,106) | (5,451) | (5,805) | (6,168) | (6,540) | (6,916) | (7,299) | (7,690) | (8,091) | (8,501) |
| Net Plant in Service               | 6,425   | 6,594   | 6,735   | 6,775   | 6,915   | 6,883   | 6,937   | 7,866   | 8,120   | 8,057   | 7,953   | 8,239   | 8,357   | 8,477   | 8,600   | 8,705   | 8,778   |
| Construct in Progress              | 428     | 509     | 633     | 741     | 880     | 1,284   | 1,522   | 721     | 459     | 466     | 491     | 319     | 321     | 471     | 536     | 637     | 842     |
| Current & Other Assets             | 3,560   | 3,289   | 3,375   | 3,605   | 3,773   | 3,939   | 3,766   | 3,453   | 3,707   | 3,982   | 4,262   | 4,098   | 4,435   | 4,540   | 4,773   | 4,949   | 4,661   |
|                                    | 10,412  | 10,392  | 10,743  | 11,121  | 11,568  | 12,107  | 12,225  | 12,040  | 12,286  | 12,504  | 12,705  | 12,656  | 13,113  | 13,489  | 13,908  | 14,292  | 14,281  |
| <b>LIABILITIES</b>                 |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Long Term Debt (Net)               | 7,187   | 7,167   | 7,478   | 7,429   | 8,307   | 8,719   | 8,586   | 8,666   | 9,050   | 9,026   | 8,722   | 8,894   | 9,209   | 9,007   | 9,465   | 8,923   | 9,507   |
| Current & Other Liab               | 1,783   | 1,770   | 1,755   | 2,140   | 1,662   | 1,760   | 1,969   | 1,655   | 1,458   | 1,626   | 2,041   | 1,737   | 1,735   | 2,273   | 2,133   | 2,964   | 2,276   |
| NCN Investment in Waukegan Project | 0       | 0       | 15      | 25      | 36      | 49      | 59      | 62      | 60      | 60      | 59      | 58      | 57      | 56      | 55      | 54      | 53      |
| Contrib for Construct              | 266     | 262     | 259     | 255     | 251     | 246     | 242     | 238     | 234     | 231     | 227     | 223     | 219     | 216     | 212     | 209     | 206     |
| Retained Earnings                  | 1,176   | 1,193   | 1,237   | 1,272   | 1,313   | 1,332   | 1,369   | 1,420   | 1,484   | 1,562   | 1,657   | 1,744   | 1,833   | 1,937   | 2,043   | 2,142   | 2,238   |
|                                    | 10,412  | 10,392  | 10,743  | 11,121  | 11,568  | 12,107  | 12,225  | 12,040  | 12,286  | 12,504  | 12,705  | 12,656  | 13,113  | 13,489  | 13,908  | 14,292  | 14,281  |
| Debt/Equity Ratio                  | 79.21   | 79.21   | 80.20   | 80.20   | 81.19   | 81.19   | 82.18   | 81.19   | 81.19   | 80.20   | 78.22   | 78.22   | 77.23   | 77.23   | 76.24   | 76.24   | 76.24   |

**ATTACHMENT CCC/NFAAT/S/7a Table: A.21 (cont'd)**

Wuskwatim 2009 Low Price Scenario

**PROJECTED BALANCE SHEET**  
Electric Operations  
(In Millions of Dollars)

| For year ending March 31:           | 2020    | 2021    | 2022    | 2023     | 2024     | 2025     | 2026     | 2027     | 2028     | 2029     | 2030     | 2031     | 2032     | 2033     | 2034     | 2035     |
|-------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>ASSETS</b>                       |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Plant in Service                    | 17,774  | 18,276  | 18,787  | 19,308   | 22,118   | 24,443   | 24,995   | 25,558   | 26,132   | 26,717   | 27,317   | 27,926   | 28,546   | 29,178   | 30,025   | 30,684   |
| Accum Depreciation                  | (8,920) | (9,350) | (9,788) | (10,238) | (10,725) | (11,260) | (11,796) | (12,340) | (12,890) | (13,448) | (14,013) | (14,587) | (15,169) | (15,758) | (16,356) | (16,971) |
| Net Plant in Service                | 8,854   | 8,926   | 8,999   | 9,071    | 11,393   | 13,183   | 13,199   | 13,218   | 13,242   | 13,269   | 13,304   | 13,339   | 13,377   | 13,420   | 13,669   | 13,713   |
| Construct in Progress               | 1,264   | 1,905   | 2,677   | 3,516    | 1,963    | 344      | 347      | 349      | 352      | 354      | 357      | 377      | 456      | 547      | 569      | 372      |
| Current & Other Assets              | 4,719   | 4,658   | 4,067   | 4,149    | 4,454    | 4,786    | 4,840    | 5,205    | 5,606    | 5,972    | 6,174    | 6,046    | 6,517    | 7,030    | 7,282    | 7,559    |
|                                     | 14,838  | 15,489  | 15,742  | 16,736   | 17,810   | 18,313   | 18,386   | 18,773   | 19,199   | 19,596   | 19,836   | 19,762   | 20,350   | 20,997   | 21,320   | 21,644   |
| <b>LIABILITIES</b>                  |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Long Term Debt (Net)                | 9,761   | 9,672   | 10,465  | 11,464   | 12,264   | 12,164   | 12,364   | 12,564   | 12,504   | 12,454   | 12,054   | 12,446   | 12,646   | 12,746   | 12,646   | 13,046   |
| Current & Other Liab.               | 2,485   | 3,128   | 2,484   | 2,368    | 2,524    | 3,004    | 2,755    | 2,821    | 3,187    | 3,513    | 4,031    | 3,446    | 3,718    | 4,148    | 4,452    | 4,258    |
| NCN Investment in Wuskwatim Project | 53      | 52      | 51      | 50       | 49       | 48       | 47       | 46       | 45       | 44       | 44       | 43       | 42       | 41       | 40       | 39       |
| Contrib for Construct.              | 204     | 201     | 199     | 197      | 195      | 193      | 191      | 190      | 189      | 188      | 188      | 188      | 189      | 190      | 191      | 194      |
| Retained Earnings                   | 2,335   | 2,437   | 2,544   | 2,657    | 2,779    | 2,904    | 3,029    | 3,152    | 3,275    | 3,397    | 3,519    | 3,639    | 3,756    | 3,873    | 3,990    | 4,108    |
|                                     | 14,838  | 15,489  | 15,742  | 16,736   | 17,810   | 18,313   | 18,386   | 18,773   | 19,199   | 19,596   | 19,836   | 19,762   | 20,350   | 20,997   | 21,320   | 21,644   |
| Debt Equity Ratio                   | 76.24   | 77.23   | 77.23   | 78.22    | 79.21    | 78.22    | 77.23    | 77.23    | 76.24    | 75.25    | 75.25    | 74.26    | 74.26    | 73.27    | 73.27    | 72.28    |

ATTACHMENT CCC/NFAAT/3/7a Table: A.21 (cont'd)

Waukegan 2009 Low Price Scenario

FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)

For year ending March 31

FUNDS FROM OPERATIONS

|                      | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Net Income           | 71   | 68   | 45   | 35   | 40   | 19   | 37   | 51   | 64   | 78   | 95   | 87   | 89   | 104  | 105  | 99   | 96   |
| Provision for Deprec | 256  | 270  | 282  | 301  | 310  | 324  | 331  | 350  | 363  | 372  | 381  | 390  | 396  | 394  | 402  | 410  | 420  |
| Other (Net)          | (40) | (40) | 149  | 96   | 93   | 98   | 64   | 13   | (29) | (40) | (50) | (54) | (55) | (75) | (87) | (78) | (72) |
|                      | 286  | 298  | 475  | 433  | 444  | 441  | 432  | 413  | 398  | 411  | 426  | 423  | 431  | 423  | 420  | 432  | 444  |

APPLICATION OF FUNDS

|                      |       |     |       |     |     |       |     |     |     |     |     |     |     |     |       |     |       |
|----------------------|-------|-----|-------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-------|
| Capital Expenditures | 377   | 424 | 518   | 536 | 570 | 675   | 602 | 447 | 331 | 289 | 273 | 477 | 488 | 497 | 511   | 599 | 678   |
| Repayment of LTD     | 316   | 0   | 211   | 103 | 94  | 292   | 0   | 0   | 103 | 0   | 0   | 0   | 0   | 0   | 451   | 253 | 377   |
| Sinking Fund Deposit | 81    | 68  | 84    | 84  | 90  | 83    | 89  | 128 | 178 | 181 | 180 | 185 | 187 | 61  | 63    | 68  | 79    |
| Other                | 380   | 174 | 257   | 227 | 181 | 191   | 159 | 92  | 48  | 49  | 53  | 77  | 93  | 102 | 106   | 66  | 69    |
|                      | 1,154 | 667 | 1,070 | 949 | 936 | 1,241 | 851 | 667 | 660 | 518 | 506 | 738 | 768 | 659 | 1,131 | 987 | 1,203 |

FINANCING REQUIREMENTS

|  |     |     |     |     |     |     |     |     |     |     |    |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|
|  | 868 | 369 | 595 | 517 | 492 | 799 | 418 | 254 | 262 | 108 | 80 | 316 | 337 | 236 | 710 | 556 | 750 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|

ATTACHMENT CCC/NFAAT/S/7a Table: A.21 (cont'd)

Waukegan 2009 Low Price Scenario

FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)

For year ending March 31:

FUNDS FROM OPERATIONS

|                      | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Net Income           | 97   | 102  | 107  | 113  | 122  | 125  | 125  | 123  | 123  | 122  | 122  | 120  | 116  | 117  | 118  | 117  |
| Provision for Deprec | 427  | 437  | 446  | 456  | 491  | 538  | 540  | 547  | 555  | 562  | 570  | 579  | 587  | 596  | 605  | 623  |
| Other (Net)          | (60) | (46) | (26) | 12   | 15   | 13   | 10   | 5    | (9)  | (15) | (22) | (28) | (40) | (49) | (59) | (72) |
|                      | 465  | 494  | 527  | 581  | 628  | 676  | 675  | 675  | 668  | 670  | 670  | 671  | 664  | 664  | 664  | 668  |

APPLICATION OF FUNDS

|                      |       |       |       |       |       |     |     |     |     |     |     |     |     |     |     |     |
|----------------------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Capital Expenditures | 907   | 1,131 | 1,271 | 1,349 | 1,246 | 694 | 543 | 554 | 565 | 577 | 592 | 617 | 688 | 713 | 658 | 652 |
| Repayment of LTD     | 0     | 0     | 0     | 0     | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| Sinking Fund Deposit | 77    | 96    | 118   | 133   | 145   | 159 | 168 | 162 | 171 | 178 | 185 | 182 | 166 | 175 | 187 | 183 |
| Other                | 71    | 75    | 78    | 81    | 83    | 86  | 89  | 92  | 95  | 98  | 101 | 105 | 105 | 108 | 112 | 114 |
|                      | 1,056 | 1,302 | 1,467 | 1,564 | 1,473 | 939 | 800 | 808 | 831 | 853 | 877 | 904 | 959 | 997 | 957 | 949 |

FINANCING REQUIREMENTS

|  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|  | 591 | 808 | 940 | 983 | 846 | 263 | 125 | 133 | 163 | 183 | 207 | 233 | 295 | 332 | 293 | 280 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

**ATTACHMENT CCC/NFAAT/S/7a Table: A.22 (cont'd)**

Wuskwatim 2020 Low Price Scenario

**PROJECTED BALANCE SHEET**  
Electric Operations  
(In Millions of Dollars)

For year ending March 31

ASSETS

|                        | 2003    | 2004    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    |
|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Plant in Service       | 9,462   | 9,894   | 10,308  | 10,633  | 11,067  | 11,342  | 11,710  | 11,995  | 12,649  | 12,940  | 13,199  | 13,856  | 14,351  | 14,854  | 15,368  | 15,874  | 16,357  |
| Accum Depreciation     | (3,037) | (3,300) | (3,573) | (3,858) | (4,151) | (4,459) | (4,773) | (5,095) | (5,425) | (5,764) | (6,112) | (6,469) | (6,831) | (7,199) | (7,576) | (7,962) | (8,357) |
| Net Plant in Service   | 6,425   | 6,594   | 6,735   | 6,775   | 6,915   | 6,883   | 6,937   | 6,901   | 7,224   | 7,176   | 7,087   | 7,387   | 7,520   | 7,655   | 7,792   | 7,913   | 8,000   |
| Construct in Progress  | 444     | 503     | 454     | 419     | 380     | 592     | 662     | 789     | 479     | 486     | 511     | 459     | 513     | 771     | 1,015   | 1,331   | 1,778   |
| Current & Other Assets | 3,540   | 3,269   | 3,422   | 3,635   | 3,785   | 3,930   | 3,738   | 3,434   | 3,684   | 3,960   | 4,248   | 3,989   | 4,318   | 4,435   | 4,671   | 4,854   | 4,577   |
|                        | 10,409  | 10,366  | 10,611  | 10,829  | 11,080  | 11,405  | 11,336  | 11,123  | 11,387  | 11,622  | 11,845  | 11,836  | 12,351  | 12,861  | 13,479  | 14,097  | 14,355  |

LIABILITIES

|                                     |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Long Term Debt (Net)                | 7,187  | 7,167  | 7,478  | 7,429  | 7,907  | 8,119  | 7,786  | 7,866  | 8,250  | 8,226  | 7,922  | 8,294  | 8,669  | 8,407  | 9,065  | 8,923  | 9,707  |
| Current & Other Liab                | 1,780  | 1,744  | 1,644  | 1,891  | 1,636  | 1,740  | 1,975  | 1,638  | 1,451  | 1,643  | 2,088  | 1,622  | 1,679  | 2,342  | 2,199  | 2,850  | 2,214  |
| NCN Investment in Wuskwatim Project | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 21     | 34     | 49     | 64     |
| Contrib for Construct               | 266    | 262    | 259    | 255    | 251    | 246    | 242    | 238    | 234    | 231    | 227    | 223    | 219    | 216    | 212    | 209    | 206    |
| Retained Earnings                   | 1,176  | 1,193  | 1,230  | 1,255  | 1,286  | 1,300  | 1,333  | 1,381  | 1,452  | 1,522  | 1,609  | 1,697  | 1,785  | 1,875  | 1,968  | 2,065  | 2,162  |
|                                     | 10,409 | 10,366 | 10,611 | 10,829 | 11,080 | 11,405 | 11,336 | 11,123 | 11,387 | 11,622 | 11,845 | 11,836 | 12,351 | 12,861 | 13,479 | 14,097 | 14,355 |

Debt Equity Ratio

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 79.21 | 79.21 | 80.20 | 80.20 | 80.20 | 80.20 | 80.20 | 80.20 | 80.20 | 79.21 | 78.22 | 77.23 | 76.24 | 76.24 | 76.24 | 76.24 | 76.24 | 77.23 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

ATTACHMENT CCC/NFAAT/S/7a Table: A.22 (cont'd)

Wuskwatim 2020 Low Price Scenario

PROJECTED BALANCE SHEET  
Electric Operations  
(In Millions of Dollars)

| For year ending March 31            | 2020    | 2021    | 2022    | 2023     | 2024     | 2025     | 2026     | 2027     | 2028     | 2029     | 2030     | 2031     | 2032     | 2033     | 2034     | 2035     |
|-------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>ASSETS</b>                       |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Plant in Service                    | 16,849  | 18,552  | 19,063  | 19,584   | 22,394   | 24,719   | 25,271   | 25,834   | 26,408   | 26,993   | 27,590   | 28,202   | 28,822   | 29,454   | 30,301   | 30,958   |
| Accum Depreciation                  | (8,761) | (9,189) | (9,632) | (10,086) | (10,578) | (11,117) | (11,657) | (12,205) | (12,760) | (13,322) | (13,892) | (14,470) | (15,056) | (15,650) | (16,252) | (16,872) |
| Net Plant in Service                | 8,088   | 9,363   | 9,431   | 9,499    | 11,816   | 13,603   | 13,614   | 13,629   | 13,648   | 13,671   | 13,698   | 13,732   | 13,766   | 13,804   | 14,049   | 14,086   |
| Construct in Progress               | 2,411   | 1,925   | 2,696   | 3,536    | 1,983    | 364      | 366      | 369      | 372      | 374      | 377      | 397      | 476      | 567      | 388      | 391      |
| Current & Other Assets              | 4,644   | 4,554   | 3,962   | 4,043    | 4,347    | 4,678    | 4,730    | 5,090    | 5,472    | 5,819    | 5,999    | 5,846    | 6,285    | 6,762    | 6,972    | 7,201    |
|                                     | 15,143  | 15,842  | 16,090  | 17,078   | 18,147   | 18,644   | 18,710   | 19,088   | 19,491   | 19,864   | 20,074   | 19,974   | 20,526   | 21,133   | 21,409   | 21,679   |
| <b>LIABILITIES</b>                  |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Long Term Debt (Net)                | 10,161  | 10,072  | 10,865  | 11,864   | 12,664   | 12,564   | 12,764   | 12,764   | 12,904   | 12,854   | 12,454   | 12,646   | 12,846   | 12,746   | 12,646   | 13,046   |
| Current & Other Liab                | 2,438   | 3,118   | 2,464   | 2,339    | 2,484    | 2,954    | 2,693    | 2,947    | 3,086    | 3,383    | 3,869    | 3,454    | 3,686    | 4,274    | 4,528    | 4,276    |
| NCN Investment in Wuskwatim Project | 77      | 81      | 80      | 78       | 77       | 76       | 75       | 73       | 72       | 71       | 70       | 69       | 68       | 66       | 65       | 64       |
| Contrib for Construct.              | 204     | 201     | 199     | 197      | 195      | 193      | 191      | 190      | 189      | 188      | 188      | 188      | 189      | 190      | 191      | 194      |
| Retained Earnings                   | 2,263   | 2,370   | 2,482   | 2,600    | 2,727    | 2,857    | 2,987    | 3,114    | 3,242    | 3,368    | 3,493    | 3,618    | 3,738    | 3,858    | 3,979    | 4,100    |
|                                     | 15,143  | 15,842  | 16,090  | 17,078   | 18,147   | 18,644   | 18,710   | 19,088   | 19,491   | 19,864   | 20,074   | 19,974   | 20,526   | 21,133   | 21,409   | 21,679   |
| Debt Equity Ratio                   | 77.23   | 78.22   | 79.21   | 79.21    | 80.20    | 79.21    | 78.22    | 78.22    | 77.23    | 76.24    | 76.24    | 75.25    | 75.25    | 74.26    | 74.26    | 73.27    |



ATTACHMENT CCC/NFAAT/S/7a Table: A.22 (cont'd)

Waukegan 2020 Low Price Scenario

FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)

| For year ending March 31     | 2003  | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017  | 2018  | 2019  |
|------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| <u>FUNDS FROM OPERATIONS</u> |       |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
| Net Income                   | 71    | 68   | 38   | 24   | 32   | 14   | 33   | 48   | 70   | 70   | 87   | 88   | 68   | 90   | 93    | 97    | 97    |
| Provision for Deprec         | 256   | 270  | 287  | 307  | 316  | 330  | 337  | 345  | 354  | 364  | 374  | 375  | 382  | 380  | 387   | 396   | 405   |
| Other (Net)                  | (40)  | (30) | (20) | (30) | (41) | (51) | (53) | (48) | (35) | (51) | (67) | (79) | (85) | 156  | 47    | 61    | 83    |
|                              | 286   | 299  | 296  | 301  | 307  | 293  | 317  | 345  | 389  | 383  | 395  | 384  | 385  | 625  | 527   | 554   | 585   |
| <u>APPLICATION OF FUNDS</u>  |       |      |      |      |      |      |      |      |      |      |      |      |      |      |       |       |       |
| Capital Expenditures         | 373   | 419  | 430  | 394  | 392  | 483  | 435  | 407  | 334  | 289  | 273  | 481  | 494  | 604  | 691   | 812   | 921   |
| Repayment of LTD             | 316   | 0    | 211  | 103  | 94   | 292  | 0    | 0    | 103  | 0    | 0    | 0    | 0    | 0    | 451   | 255   | 377   |
| Sinking Fund Deposit         | 81    | 68   | 84   | 84   | 60   | 83   | 89   | 128  | 172  | 175  | 174  | 179  | 181  | 53   | 53    | 58    | 71    |
| Other                        | 380   | 158  | 81   | 100  | 46   | 39   | 39   | 40   | 52   | 51   | 57   | 78   | 105  | 330  | 239   | 205   | 226   |
|                              | 1,150 | 645  | 806  | 680  | 622  | 896  | 563  | 575  | 661  | 515  | 504  | 738  | 780  | 987  | 1,434 | 1,330 | 1,595 |
| FINANCING REQUIREMENTS       | 864   | 346  | 510  | 379  | 315  | 604  | 246  | 231  | 272  | 132  | 110  | 354  | 395  | 362  | 907   | 777   | 1,010 |

ATTACHMENT CCC/NFAAT/S/7a Table: A.22 (cont'd)

Waukegan 2020 Low Price Scenario

FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)

For year ending March 31:

FUNDS FROM OPERATIONS

|                      | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Net Income           | 100  | 107  | 112  | 118  | 127  | 130  | 130  | 128  | 127  | 126  | 126  | 124  | 120  | 121  | 121  | 120  |
| Provision for Deprec | 413  | 435  | 450  | 460  | 496  | 542  | 544  | 551  | 559  | 567  | 574  | 583  | 592  | 600  | 609  | 627  |
| Other (Net)          | 53   | 3    | (52) | (15) | (12) | (14) | (16) | (19) | (22) | (25) | (29) | (35) | (41) | (47) | (53) | (62) |
|                      | 566  | 545  | 510  | 564  | 611  | 659  | 657  | 660  | 664  | 668  | 671  | 673  | 671  | 674  | 677  | 685  |

APPLICATION OF FUNDS

|                      |       |       |       |       |       |     |     |     |     |     |     |     |     |     |     |     |
|----------------------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Capital Expenditures | 1,115 | 1,196 | 1,271 | 1,349 | 1,246 | 694 | 543 | 554 | 565 | 577 | 588 | 621 | 688 | 713 | 658 | 649 |
| Repayment of LTD     | 0     | 0     | 0     | 0     | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| Sinking Fund Deposit | 70    | 89    | 118   | 133   | 144   | 158 | 166 | 159 | 166 | 174 | 180 | 177 | 156 | 164 | 173 | 167 |
| Other                | 187   | 105   | 52    | 55    | 56    | 60  | 62  | 66  | 69  | 72  | 76  | 78  | 82  | 86  | 90  | 92  |
|                      | 1,372 | 1,391 | 1,440 | 1,536 | 1,446 | 911 | 771 | 779 | 800 | 823 | 844 | 876 | 926 | 963 | 920 | 909 |

FINANCING REQUIREMENTS

|  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|  | 806 | 846 | 930 | 973 | 835 | 253 | 114 | 120 | 136 | 156 | 173 | 203 | 255 | 280 | 243 | 223 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

**ATTACHMENT CCC/NFAAT/S/7a Table: A.23 (cont'd)**

Waukegan 2009 High Price Scenario

**PROJECTED BALANCE SHEET  
Electric Operations  
(In Millions of Dollars)**

| For year ending March 31:          | 2003    | 2004    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    |
|------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>ASSETS</b>                      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Plant in Service                   | 9,462   | 9,894   | 10,308  | 10,633  | 11,067  | 11,342  | 11,710  | 12,972  | 13,571  | 13,862  | 14,121  | 14,778  | 15,273  | 15,776  | 16,290  | 16,796  | 17,279  |
| Accum Depreciation                 | (3,037) | (3,300) | (3,573) | (3,858) | (4,151) | (4,459) | (4,773) | (5,106) | (5,451) | (5,805) | (6,168) | (6,540) | (6,916) | (7,299) | (7,690) | (8,091) | (8,501) |
| Net Plant in Service               | 6,425   | 6,594   | 6,735   | 6,775   | 6,915   | 6,883   | 6,937   | 7,866   | 8,120   | 8,057   | 7,953   | 8,239   | 8,357   | 8,477   | 8,600   | 8,705   | 8,778   |
| Construct in Progress              | 428     | 509     | 633     | 741     | 880     | 1,284   | 1,522   | 721     | 459     | 466     | 491     | 319     | 321     | 471     | 536     | 637     | 842     |
| Current & Other Assets             | 3,560   | 3,289   | 3,375   | 3,605   | 3,773   | 3,939   | 3,766   | 3,445   | 3,691   | 3,954   | 4,260   | 4,044   | 4,370   | 4,468   | 4,693   | 4,863   | 4,571   |
|                                    | 10,412  | 10,392  | 10,743  | 11,121  | 11,568  | 12,107  | 12,225  | 12,032  | 12,269  | 12,477  | 12,703  | 12,602  | 13,048  | 13,416  | 13,828  | 14,206  | 14,190  |
| <b>LIABILITIES</b>                 |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Long Term Debt (Net)               | 7,187   | 7,167   | 7,478   | 7,429   | 8,307   | 8,719   | 8,386   | 8,466   | 8,650   | 8,626   | 8,122   | 8,294   | 8,469   | 8,207   | 8,665   | 8,323   | 8,907   |
| Current & Other Liab               | 1,783   | 1,770   | 1,755   | 2,133   | 1,633   | 1,693   | 2,053   | 1,654   | 1,534   | 1,545   | 2,026   | 1,634   | 1,822   | 2,368   | 2,236   | 2,868   | 2,183   |
| NCN Investment in Waukegan Project | 0       | 0       | 15      | 25      | 36      | 49      | 59      | 62      | 61      | 60      | 59      | 58      | 57      | 56      | 55      | 54      | 53      |
| Contrib for Construct              | 266     | 262     | 259     | 255     | 251     | 246     | 242     | 238     | 234     | 231     | 227     | 223     | 219     | 216     | 212     | 209     | 206     |
| Retained Earnings                  | 1,176   | 1,193   | 1,237   | 1,279   | 1,341   | 1,399   | 1,485   | 1,612   | 1,790   | 2,015   | 2,270   | 2,393   | 2,481   | 2,569   | 2,660   | 2,752   | 2,841   |
|                                    | 10,412  | 10,392  | 10,743  | 11,121  | 11,568  | 12,107  | 12,225  | 12,032  | 12,269  | 12,477  | 12,703  | 12,602  | 13,048  | 13,416  | 13,828  | 14,206  | 14,190  |
| Debt Equity Ratio                  | 79.21   | 79.21   | 80.20   | 80.20   | 80.20   | 80.20   | 80.20   | 79.21   | 77.23   | 74.26   | 71.29   | 70.30   | 70.30   | 70.30   | 69.31   | 69.31   | 69.31   |

ATTACHMENT CCC/NFAAT/S/7a Table: A.23 (cont'd)

Waukegan 2009 High Price Scenario

PROJECTED BALANCE SHEET  
Electric Operations  
(In Millions of Dollars)

| For year ending March 31:          | 2020    | 2021    | 2022    | 2023     | 2024     | 2025     | 2026     | 2027     | 2028     | 2029     | 2030     | 2031     | 2032     | 2033     | 2034     | 2035     |
|------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>ASSETS</b>                      |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Plant in Service                   | 17,774  | 18,276  | 18,787  | 19,308   | 22,118   | 24,443   | 24,995   | 25,558   | 26,132   | 26,717   | 27,317   | 27,926   | 28,546   | 29,178   | 30,025   | 30,684   |
| Accum Depreciation                 | (8,920) | (9,350) | (9,788) | (10,238) | (10,725) | (11,260) | (11,796) | (12,340) | (12,890) | (13,448) | (14,013) | (14,587) | (15,169) | (15,758) | (16,356) | (16,971) |
| Net Plant in Service               | 8,854   | 8,926   | 8,999   | 9,071    | 11,393   | 13,183   | 13,199   | 13,218   | 13,242   | 13,269   | 13,304   | 13,339   | 13,377   | 13,420   | 13,669   | 13,713   |
| Construct in Progress              | 1,264   | 1,905   | 2,677   | 3,516    | 1,963    | 344      | 347      | 349      | 352      | 354      | 357      | 377      | 456      | 547      | 369      | 372      |
| Current & Other Assets             | 4,625   | 4,561   | 3,966   | 4,044    | 4,346    | 4,678    | 4,733    | 5,097    | 5,486    | 5,841    | 6,033    | 5,893    | 6,350    | 6,850    | 7,088    | 7,351    |
|                                    | 14,744  | 15,392  | 15,642  | 16,631   | 17,702   | 18,205   | 18,278   | 18,665   | 19,079   | 19,465   | 19,694   | 19,609   | 20,183   | 20,817   | 21,125   | 21,435   |
| <b>LIABILITIES</b>                 |         |         |         |          |          |          |          |          |          |          |          |          |          |          |          |          |
| Long Term Debt (Net)               | 9,161   | 9,072   | 9,665   | 10,664   | 11,664   | 11,564   | 11,764   | 11,764   | 11,904   | 11,854   | 11,454   | 11,646   | 12,046   | 11,946   | 12,046   | 12,246   |
| Current & Other Liab               | 2,395   | 3,041   | 2,601   | 2,488    | 2,447    | 2,933    | 2,691    | 2,964    | 3,124    | 3,445    | 3,959    | 3,568    | 3,633    | 4,256    | 4,352    | 4,350    |
| NCN Investment in Waukegan Project | 53      | 52      | 51      | 50       | 49       | 48       | 47       | 46       | 45       | 44       | 44       | 43       | 42       | 41       | 40       | 39       |
| Contrib for Construct              | 204     | 201     | 199     | 197      | 195      | 193      | 191      | 190      | 189      | 188      | 188      | 188      | 189      | 190      | 191      | 194      |
| Retained Earnings                  | 2,931   | 3,026   | 3,127   | 3,233    | 3,349    | 3,467    | 3,585    | 3,702    | 3,818    | 3,934    | 4,050    | 4,164    | 4,274    | 4,385    | 4,496    | 4,607    |
|                                    | 14,744  | 15,392  | 15,642  | 16,631   | 17,702   | 18,205   | 18,278   | 18,665   | 19,079   | 19,465   | 19,694   | 19,609   | 20,183   | 20,817   | 21,125   | 21,435   |
| Debt Equity Ratio                  | 70.30   | 71.29   | 72.28   | 74.26    | 74.26    | 74.26    | 73.27    | 73.27    | 72.28    | 72.28    | 71.29    | 71.29    | 70.30    | 70.30    | 70.30    | 69.31    |

**ATTACHMENT CCC/NFAAT/S/7a Table: A.23 (cont'd)**

Waukegan 2009 High Price Scenario

**FINANCING REQUIREMENTS STATEMENTS**  
Electric Operations  
(In Millions of Dollars)

For year ending March 31:

FUNDS FROM OPERATIONS

|                      | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Net Income           | 71   | 68   | 45   | 42   | 62   | 58   | 85   | 127  | 178  | 225  | 254  | 124  | 87   | 88   | 96   | 92   | 89   |
| Provision for Deprec | 236  | 270  | 282  | 301  | 310  | 324  | 331  | 350  | 363  | 372  | 381  | 390  | 396  | 394  | 402  | 410  | 420  |
| Other (Net)          | (40) | (40) | 149  | 96   | 93   | 98   | 64   | 40   | 13   | 16   | 10   | 11   | 11   | (18) | (28) | (18) | (11) |
|                      | 286  | 298  | 475  | 440  | 465  | 480  | 481  | 517  | 554  | 613  | 645  | 525  | 495  | 464  | 464  | 484  | 498  |

APPLICATION OF FUNDS

|                      |       |     |       |     |     |       |     |     |     |     |     |     |     |     |       |       |       |
|----------------------|-------|-----|-------|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| Capital Expenditures | 377   | 424 | 518   | 556 | 570 | 675   | 662 | 447 | 331 | 289 | 273 | 477 | 488 | 497 | 511   | 599   | 678   |
| Repayment of LTD     | 316   | 0   | 211   | 103 | 94  | 292   | 0   | 0   | 103 | 0   | 0   | 0   | 0   | 0   | 451   | 255   | 377   |
| Sinking Fund Deposit | 81    | 68  | 84    | 84  | 90  | 83    | 89  | 128 | 178 | 181 | 180 | 185 | 187 | 53  | 55    | 59    | 72    |
| Other                | 380   | 174 | 257   | 227 | 181 | 191   | 159 | 111 | 82  | 94  | 101 | 128 | 147 | 159 | 166   | 128   | 133   |
|                      | 1,154 | 667 | 1,070 | 949 | 936 | 1,241 | 851 | 686 | 693 | 564 | 554 | 789 | 822 | 709 | 1,182 | 1,040 | 1,259 |

FINANCING REQUIREMENTS

|  |     |     |     |     |     |     |     |     |     |      |      |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|
|  | 868 | 369 | 595 | 510 | 470 | 761 | 370 | 169 | 139 | (49) | (91) | 265 | 327 | 244 | 718 | 556 | 762 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|

ATTACHMENT CCC/NFAAT/S/7a Table: A.23 (cont'd)

Wauwatam 2009 High Price Scenario

FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)

| For year ending March 31     | 2020  | 2021  | 2022  | 2023  | 2024  | 2025  | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032  | 2033  | 2034  | 2035  |
|------------------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|-------|-------|-------|-------|
| <u>FUNDS FROM OPERATIONS</u> |       |       |       |       |       |       |      |      |      |      |      |      |       |       |       |       |
| Net Income                   | 90    | 95    | 100   | 107   | 115   | 119   | 118  | 117  | 116  | 116  | 115  | 114  | 110   | 111   | 111   | 111   |
| Provision for Deprec         | 427   | 437   | 446   | 456   | 491   | 538   | 540  | 547  | 555  | 562  | 570  | 579  | 587   | 596   | 605   | 623   |
| Other (Net)                  | 3     | 20    | 41    | 78    | 82    | 80    | 77   | 74   | 71   | 67   | 62   | 57   | 47    | 40    | 32    | 20    |
|                              | 520   | 553   | 587   | 641   | 688   | 736   | 735  | 738  | 742  | 745  | 747  | 750  | 745   | 747   | 748   | 754   |
| <u>APPLICATION OF FUNDS</u>  |       |       |       |       |       |       |      |      |      |      |      |      |       |       |       |       |
| Capital Expenditures         | 907   | 1,131 | 1,271 | 1,349 | 1,246 | 694   | 543  | 554  | 565  | 577  | 592  | 617  | 688   | 713   | 658   | 652   |
| Repayment of LTD             | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     |
| Sinking Fund Deposit         | 70    | 89    | 110   | 123   | 134   | 150   | 158  | 152  | 158  | 167  | 174  | 171  | 152   | 163   | 172   | 169   |
| Other                        | 138   | 145   | 149   | 154   | 157   | 162   | 166  | 170  | 175  | 180  | 184  | 190  | 192   | 197   | 203   | 206   |
|                              | 1,115 | 1,364 | 1,531 | 1,626 | 1,537 | 1,006 | 867  | 877  | 899  | 924  | 949  | 978  | 1,032 | 1,073 | 1,033 | 1,027 |
| FINANCING REQUIREMENTS       | 595   | 811   | 944   | 985   | 849   | 269   | 132  | 139  | 157  | 179  | 202  | 228  | 287   | 326   | 285   | 273   |

# ATTACHMENT CCC/NFAAT/5/7a Table: A.24 (cont'd)

Wuskwatim 2020 High Price Scenario

## PROJECTED BALANCE SHEET Electric Operations (In Millions of Dollars)

For year ending March 31:

### ASSETS

|                        | 2003    | 2004    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    |
|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Plant in Service       | 9,462   | 9,894   | 10,308  | 10,633  | 11,067  | 11,342  | 11,710  | 11,995  | 12,649  | 12,940  | 13,199  | 13,856  | 14,351  | 14,854  | 15,368  | 15,874  | 16,357  |
| Accum Depreciation     | (3,037) | (3,300) | (3,573) | (3,858) | (4,151) | (4,459) | (4,773) | (5,095) | (5,425) | (5,764) | (6,112) | (6,469) | (6,831) | (7,199) | (7,576) | (7,962) | (8,357) |
| Net Plant in Service   | 6,425   | 6,594   | 6,735   | 6,775   | 6,915   | 6,883   | 6,937   | 6,901   | 7,224   | 7,176   | 7,087   | 7,387   | 7,520   | 7,655   | 7,792   | 7,913   | 8,000   |
| Construct in Progress  | 444     | 503     | 454     | 419     | 380     | 592     | 662     | 789     | 479     | 486     | 511     | 459     | 513     | 771     | 1,015   | 1,331   | 1,778   |
| Current & Other Assets | 3,540   | 3,269   | 3,422   | 3,635   | 3,785   | 3,930   | 3,738   | 3,434   | 3,684   | 3,994   | 4,292   | 3,989   | 4,318   | 4,429   | 4,661   | 4,837   | 4,553   |
|                        | 10,409  | 10,366  | 10,611  | 10,829  | 11,080  | 11,405  | 11,336  | 11,123  | 11,387  | 11,656  | 11,890  | 11,836  | 12,351  | 12,855  | 13,469  | 14,080  | 14,331  |

### LIABILITIES

|                                     |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Long Term Debt (Net)                | 7,187  | 7,167  | 7,478  | 7,429  | 7,907  | 8,119  | 7,786  | 7,666  | 7,850  | 8,026  | 7,522  | 7,694  | 8,069  | 8,007  | 8,465  | 8,323  | 9,107  |
| Current & Other Liab                | 1,780  | 1,744  | 1,644  | 1,884  | 1,607  | 1,672  | 1,859  | 1,658  | 1,577  | 1,492  | 2,026  | 1,722  | 1,784  | 2,247  | 2,305  | 2,955  | 2,318  |
| NCN Investment in Wuskwatim Project | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 21     | 34     | 49     | 64     |
| Contrib for Construct               | 266    | 262    | 259    | 255    | 251    | 246    | 242    | 238    | 234    | 231    | 227    | 223    | 219    | 216    | 212    | 209    | 206    |
| Retained Earnings                   | 1,176  | 1,193  | 1,230  | 1,262  | 1,316  | 1,368  | 1,449  | 1,562  | 1,725  | 1,908  | 2,115  | 2,197  | 2,280  | 2,364  | 2,452  | 2,544  | 2,635  |
|                                     | 10,409 | 10,366 | 10,611 | 10,829 | 11,080 | 11,405 | 11,336 | 11,123 | 11,387 | 11,656 | 11,890 | 11,836 | 12,351 | 12,855 | 13,469 | 14,080 | 14,331 |

Debt Equity Ratio

|  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  | 79.21 | 79.21 | 80.20 | 80.20 | 79.21 | 79.21 | 79.21 | 78.22 | 76.24 | 73.27 | 71.29 | 70.30 | 70.30 | 70.30 | 71.29 | 71.29 | 72.28 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

**ATTACHMENT CCC/NFAAT/S/7a Table: A.24 (cont'd)**

**Wuskwatim 2020 High Price Scenario**

**PROJECTED BALANCE SHEET  
Electric Operations  
(In Millions of Dollars)**

| For year ending March 31:           | 2020          | 2021          | 2022          | 2023          | 2024          | 2025          | 2026          | 2027          | 2028          | 2029          | 2030          | 2031          | 2032          | 2033          | 2034          | 2035          |
|-------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>ASSETS</b>                       |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| Plant in Service                    | 16,849        | 18,552        | 19,063        | 19,584        | 22,394        | 24,719        | 25,271        | 25,834        | 26,408        | 26,993        | 27,590        | 28,202        | 28,822        | 29,454        | 30,301        | 30,958        |
| Accum Depreciation                  | (8,761)       | (9,189)       | (9,632)       | (10,086)      | (10,578)      | (11,117)      | (11,657)      | (12,205)      | (12,760)      | (13,322)      | (13,892)      | (14,470)      | (15,056)      | (15,650)      | (16,252)      | (16,872)      |
| Net Plant in Service                | 8,088         | 9,363         | 9,431         | 9,499         | 11,816        | 13,603        | 13,614        | 13,629        | 13,648        | 13,671        | 13,698        | 13,732        | 13,766        | 13,804        | 14,049        | 14,086        |
| Construct in Progress               | 2,411         | 1,925         | 2,696         | 3,536         | 1,983         | 364           | 366           | 369           | 372           | 374           | 377           | 397           | 476           | 567           | 388           | 391           |
| Current & Other Assets              | 4,614         | 4,500         | 3,886         | 3,941         | 4,217         | 4,527         | 4,570         | 4,922         | 5,296         | 5,635         | 5,808         | 5,646         | 6,075         | 6,546         | 6,749         | 6,973         |
|                                     | <u>15,112</u> | <u>15,788</u> | <u>16,014</u> | <u>16,976</u> | <u>18,016</u> | <u>18,493</u> | <u>18,551</u> | <u>18,920</u> | <u>19,315</u> | <u>19,680</u> | <u>19,883</u> | <u>19,774</u> | <u>20,317</u> | <u>20,917</u> | <u>21,187</u> | <u>21,451</u> |
| <b>LIABILITIES</b>                  |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |               |
| Long Term Debt (Net)                | 9,561         | 9,672         | 10,265        | 11,264        | 12,064        | 11,964        | 12,164        | 12,164        | 12,304        | 12,254        | 11,654        | 11,846        | 12,246        | 12,146        | 12,046        | 12,446        |
| Current & Other Liab.               | 2,540         | 3,002         | 2,531         | 2,385         | 2,508         | 2,962         | 2,698         | 2,948         | 3,083         | 3,379         | 4,062         | 3,643         | 3,671         | 4,256         | 4,509         | 4,256         |
| NCN Investment in Wuskwatim Project | 77            | 81            | 80            | 78            | 77            | 76            | 73            | 73            | 72            | 71            | 70            | 69            | 68            | 66            | 65            | 64            |
| Contrib for Construct               | 204           | 201           | 199           | 197           | 195           | 193           | 191           | 190           | 189           | 188           | 188           | 188           | 189           | 190           | 191           | 194           |
| Retained Earnings                   | 2,730         | 2,832         | 2,939         | 3,052         | 3,174         | 3,298         | 3,423         | 3,545         | 3,668         | 3,789         | 3,909         | 4,029         | 4,144         | 4,260         | 4,376         | 4,492         |
|                                     | <u>15,112</u> | <u>15,788</u> | <u>16,014</u> | <u>16,976</u> | <u>18,016</u> | <u>18,493</u> | <u>18,551</u> | <u>18,920</u> | <u>19,315</u> | <u>19,680</u> | <u>19,883</u> | <u>19,774</u> | <u>20,317</u> | <u>20,917</u> | <u>21,187</u> | <u>21,451</u> |
| Debt/Equity Ratio                   | 73.27         | 74.26         | 75.25         | 76.24         | 76.24         | 75.25         | 75.25         | 74.26         | 73.27         | 73.27         | 72.28         | 72.28         | 71.29         | 71.29         | 71.29         |               |



**ATTACHMENT CCC/NFAAT/S/7a Table: A.24 (cont'd)**

Wauwatam 2020 High Price Scenario

**FINANCING REQUIREMENTS STATEMENTS**  
Electric Operations  
(In Millions of Dollars)

For year ending March 31:

**FUNDS FROM OPERATIONS**

|                      | 2003       | 2004       | 2005       | 2006       | 2007       | 2008       | 2009       | 2010       | 2011       | 2012       | 2013       | 2014       | 2015       | 2016       | 2017       | 2018       | 2019       |
|----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Net Income           | 71         | 68         | 38         | 31         | 54         | 52         | 81         | 113        | 164        | 182        | 207        | 82         | 83         | 85         | 88         | 92         | 92         |
| Provision for Deprec | 256        | 270        | 287        | 307        | 316        | 330        | 337        | 345        | 354        | 364        | 374        | 375        | 382        | 380        | 387        | 396        | 405        |
| Other (Net)          | (40)       | (39)       | (29)       | (30)       | (41)       | (51)       | (53)       | (48)       | (35)       | (51)       | (67)       | (79)       | (85)       | 156        | 47         | 61         | 83         |
|                      | <u>286</u> | <u>299</u> | <u>296</u> | <u>308</u> | <u>329</u> | <u>331</u> | <u>366</u> | <u>410</u> | <u>483</u> | <u>495</u> | <u>515</u> | <u>378</u> | <u>379</u> | <u>620</u> | <u>522</u> | <u>548</u> | <u>580</u> |

**APPLICATION OF FUNDS**

|                      |              |            |            |            |            |            |            |            |            |            |            |            |            |            |              |              |              |
|----------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|
| Capital Expenditures | 373          | 419        | 430        | 394        | 392        | 483        | 435        | 407        | 334        | 289        | 273        | 481        | 494        | 604        | 691          | 812          | 921          |
| Repayment of LTD     | 316          | 0          | 211        | 103        | 94         | 292        | 0          | 0          | 103        | 0          | 0          | 0          | 0          | 0          | 451          | 255          | 377          |
| Sinking Fund Deposit | 81           | 68         | 84         | 84         | 90         | 83         | 89         | 128        | 172        | 175        | 174        | 179        | 181        | 47         | 49           | 52           | 65           |
| Other                | 380          | 158        | 81         | 100        | 46         | 39         | 39         | 40         | 52         | 51         | 57         | 78         | 105        | 330        | 239          | 205          | 226          |
|                      | <u>1,150</u> | <u>645</u> | <u>806</u> | <u>680</u> | <u>622</u> | <u>896</u> | <u>563</u> | <u>575</u> | <u>661</u> | <u>515</u> | <u>504</u> | <u>738</u> | <u>780</u> | <u>981</u> | <u>1,430</u> | <u>1,324</u> | <u>1,588</u> |

**FINANCING REQUIREMENTS**

|  |            |            |            |            |            |            |            |            |            |           |             |            |            |            |            |            |              |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-------------|------------|------------|------------|------------|------------|--------------|
|  | <u>864</u> | <u>346</u> | <u>510</u> | <u>372</u> | <u>293</u> | <u>566</u> | <u>197</u> | <u>166</u> | <u>179</u> | <u>20</u> | <u>(10)</u> | <u>359</u> | <u>401</u> | <u>361</u> | <u>908</u> | <u>776</u> | <u>1,009</u> |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-------------|------------|------------|------------|------------|------------|--------------|

**ATTACHMENT CCC/NFAAT/5/7a Table: A.24 (cont'd)**

Waukwatim 2020 High Price Scenario

**FINANCING REQUIREMENTS STATEMENTS  
Electric Operations  
(In Millions of Dollars)**

For year ending March 31:

FUNDS FROM OPERATIONS

|                      | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Net Income           | 95   | 102  | 107  | 113  | 122  | 125  | 124  | 123  | 122  | 121  | 121  | 119  | 115  | 116  | 116  | 116  |
| Provision for Deprec | 413  | 435  | 450  | 460  | 496  | 542  | 544  | 551  | 559  | 567  | 574  | 583  | 592  | 600  | 609  | 627  |
| Other (Net)          | 53   | 69   | 36   | 76   | 82   | 74   | 61   | 59   | 57   | 54   | 51   | 47   | 43   | 37   | 31   | 23   |
|                      | 561  | 606  | 593  | 650  | 700  | 741  | 729  | 733  | 738  | 742  | 746  | 749  | 750  | 754  | 757  | 766  |

APPLICATION OF FUNDS

|                      |       |       |       |       |       |     |     |     |     |     |     |     |       |       |     |     |
|----------------------|-------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-------|-------|-----|-----|
| Capital Expenditures | 1,115 | 1,196 | 1,271 | 1,349 | 1,246 | 694 | 543 | 554 | 565 | 577 | 588 | 621 | 688   | 713   | 658 | 649 |
| Repayment of LTD     | 0     | 0     | 0     | 0     | 0     | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0     | 0   | 0   |
| Sinking Fund Deposit | 63    | 82    | 112   | 125   | 136   | 149 | 157 | 150 | 156 | 165 | 170 | 165 | 143   | 153   | 161 | 155 |
| Other                | 187   | 155   | 123   | 127   | 131   | 135 | 139 | 144 | 149 | 154 | 159 | 163 | 169   | 175   | 180 | 184 |
|                      | 1,365 | 1,433 | 1,506 | 1,601 | 1,512 | 978 | 840 | 849 | 871 | 895 | 917 | 949 | 1,000 | 1,040 | 999 | 988 |

FINANCING REQUIREMENTS

|  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|  | 804 | 827 | 913 | 952 | 812 | 238 | 110 | 116 | 133 | 153 | 171 | 199 | 251 | 287 | 242 | 223 |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

CCC/NFAAT/S/8

CAC/MSOS/NFAAT/S/8

#### CONSOLIDATION ACCOUNTING

**Request:** The Crown Corporations Council and CAC/MSOS requested more background on the manner in which the Partnership will be consolidated.

**Response:** Manitoba Hydro's consolidated financial statements must fairly reflect its majority ownership interest in the Wuskwatim partnership. Section 1600 of the CICA Handbook recommends the parent-company approach as a basis for consolidation in cases where a non-controlling interest exists. The parent-company consolidation approach includes Manitoba Hydro's 67% share of the fair values of the Wuskwatim Project's assets and liabilities plus the book value of NCN's 33% share and 100% of the revenues and expenses. Since Manitoba Hydro's and NCN's investments in the Wuskwatim Project are the initial investments in a parent-founded subsidiary, the book value is the fair value at the time of investment and the distinction between book and fair values for consolidation purposes is irrelevant. The Partnership's net assets on the consolidated balance sheet must then be offset by an amount for NCN's non-controlling interest in or near the equity section of Manitoba Hydro's consolidated balance sheet. Similarly, when 100% of the Wuskwatim Partnership's revenues and expenses are included in the consolidated income statement, NCN's share of net income must be subtracted, so that net income on Manitoba Hydro's income statement will reflect only the share of the Wuskwatim Partnership's income that is attributable to Manitoba Hydro's interest in the Partnership.

The parent-company approach focuses on the control of the assets and related risks rather than ownership interests. Control is defined by the Handbook as the extent of holdings of voting shares as well as other factors that reflect the substance of the investor's relationship, including but not limited to the composition of the Board of Directors and active participation in the

1 management of the subsidiary. Since Manitoba Hydro appoints at least two-thirds of the General  
2 Partner's Board of Directors and maintains control over the day-to-day operation of the plant, the  
3 parent-company approach is anticipated to be the appropriate method for consolidating the  
4 Wuskwatim partnership with Manitoba Hydro, subject to a review by Manitoba Hydro's external  
5 auditors. By recording 100% of the assets and liabilities of the Partnership with no "off-balance  
6 sheet accounts" being utilized, the accounting is more transparent under this approach compared  
7 to other alternatives available

8  
9 An alternative approach to consolidating non-wholly owned subsidiaries is discussed in Section  
10 3055 of the CICA Handbook – Interests in Joint Ventures. Proportionate consolidation would  
11 include only Manitoba Hydro's 67% share of assets and liabilities and revenues and expenses on  
12 the consolidated statements (exclude NCN's interest entirely) and is an accepted approach for  
13 joint ventures. Control in a joint venture is typically shared equally among the investors and is  
14 the key distinguishing factor in selecting either the parent-company or proportionate  
15 consolidation approach. As stated previously, Manitoba Hydro's majority representation on the  
16 General Partner's Board and its responsibility for the day-to-day operations of the Partnership  
17 defines control over the assets of the Partnership in accordance with the Handbook definition,  
18 rendering proportionate consolidation inappropriate for accounting for this business combination.

19  
20 The expected presentation of this information is illustrated in the pro forma income statements  
21 provided in the main submission in **Attachment 7 Tables A.21 to A.24** and balance sheets  
22 provided in **Attachment CCC/NFAAT/S/7a Tables A.21 to A.24** of this supplemental filing.

23  
24 Under consolidation accounting all transactions between Manitoba Hydro and the Partnership  
25 would be eliminated, including the following:

- 26 • Inter-company export sales and power purchases
- 27 • Inter-company fees and charges
- 28 • Transmission cost recovery
- 29 • Inter-company receivables and payables

- Inter-company investment and share capital accounts

The net incremental effect on Manitoba Hydro's financial statements of the Project and any related loans to NCN will involve the following line items:

**BALANCE SHEET:**

Capital assets:

- 100% of Wuskwatim capital cost from Partnership
- Transmission facilities associated with the Project but not owned by the Partnership
- Additional amount to capitalize full interest on Manitoba Hydro's equity share

Accounts receivable:

- Equity loans to NCN and associated accrued interest receivable

Liabilities:

- 100% of Partnership liabilities (including operating loans, if required, from Manitoba Hydro to the Partnership)
- Debt to finance Manitoba Hydro's equity interest in Wuskwatim
- Debt to finance NCN's equity interest in Wuskwatim

Non-controlling interest:

- NCN's 33% share of the Partnership's assets as calculated as follows:
  - NCN's 33% investment in the generating station
  - plus NCN's 33% share of Partnership net income
  - less dividends distributed to NCN

Equity:

- Manitoba Hydro's 67% share of cumulative net earnings

**INCOME STATEMENT:**

- 100% of the Partnership revenues and expenses are reported on a line-by-line basis on the consolidated income statement

- 1 • NCN's 33% share of Partnership net income is deducted from other revenue, representing
- 2 the non-controlling interest (this was done to simplify the modeling – the Handbook
- 3 requires that it be disclosed separately as an expense item)
- 4 • Operating and carrying costs associated with the transmission facilities not owned by the
- 5 partnership
- 6 • Interest income accruing on the equity loans to NCN are offset against finance expense
- 7

8 **FINANCING REQUIREMENTS STATEMENT:**

- 9 • Manitoba Hydro's 67% share of the Partnership's net income and depreciation expense
- 10 • 100% of the Partnership's capital expenditures
- 11 • Capital expenditures for the transmission facilities not owned by the Partnership
- 12 • Payments on NCN's equity loan outstanding via NCN dividends re-allocated to Manitoba
- 13 Hydro
- 14

15 Note that consolidation accounting does not apply to loans advanced by Manitoba Hydro to NCN  
16 itself, but only to the Partnership in which Manitoba Hydro is assumed to have at least a 67%  
17 interest.

CCC/NFAAT/S/9  
CAC/MSOS/NFAAT/S/9

**FINANCIAL SENSITIVITY – 15% INCREASE/DECREASE IN BASE CAPITAL COSTS**

**Request:** The Crown Corporations Council and CAC/MSOS requested a capital cost sensitivity for the financial evaluation similar to that for the economic evaluation for the economic evaluation in **Table 6.5** of the main submission.

**Response:** Section 6.4.2 of the main submission analyzes the economic sensitivity to a \$95 million cost deviation in the base capital estimates for the generating station and transmission facilities. This supplemental section will analyze the financial impacts of the same capital cost deviation on Manitoba Hydro's consolidated profitability, performance on financial targets and cumulative rates charged to customers, within a range of low and high export prices. **Table 1** shows the range of incremental in-service costs that equates to a \$95 million change in base cost, assuming both a 2009 and 2020 in-service date. Carrying costs associated with the assets have been modified accordingly while export revenues and production costs remain unchanged.

**Table 1**

|          | Change in Wuskwatim In-Service Cost<br>(Generation & Transmission) |      |       |
|----------|--------------------------------------------------------------------|------|-------|
|          | -15%                                                               | BASE | +15%  |
| 2009 ISD | (127.2)                                                            | 0.0  | 131.0 |
| 2020 ISD | (171.6)                                                            | 0.0  | 173.3 |

**Figure 1** shows the difference in the impact of a 15% cost deviation on Manitoba Hydro's consolidated net income due to the advancement of Wuskwatim. Assuming the same general rate increases as the 2020 case, Manitoba Hydro's net income is projected to be higher in every year in all but the higher capital cost scenario under low prices. In this scenario the incremental effect

1 of the increased capital price is to drive net income slightly negative from 2011 to 2015 and  
2 again in 2017. However, from 2018 on, higher capital cost scenario even with low prices result  
3 in beneficial impacts on net income due to the advancement of Wuskwatim. The benefit to net  
4 income grows to between \$83 to \$233 million by the end of the study period. Interest coverage  
5 (**Figure 2**) follows the same pattern as net income, showing improvements in ratios in all years  
6 for the capital sensitivities under high prices. Under low prices, the lower capital cost scenario  
7 shows improvements for most years and even under the higher capital cost scenario,  
8 improvements to interest coverage ratios occur prior to the 2020 in-service date.

**Figure 1**

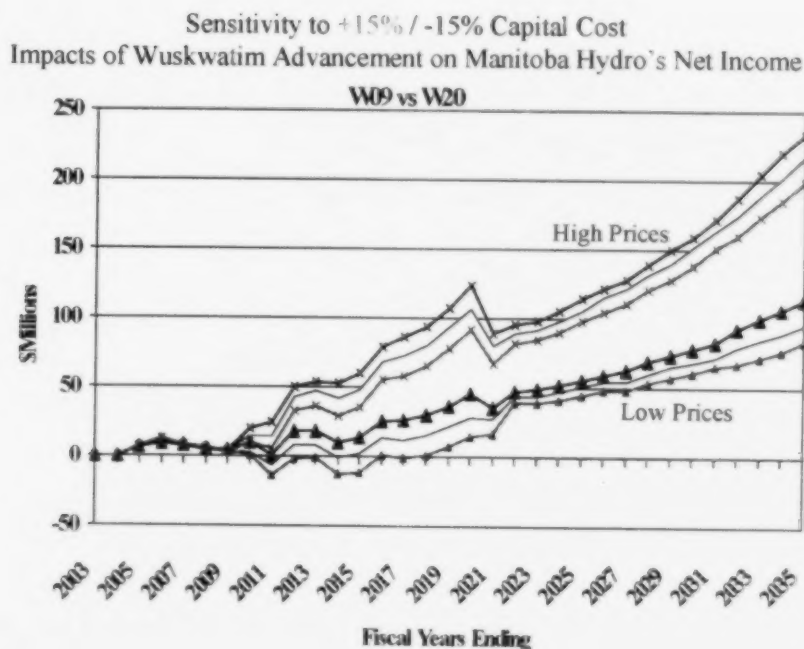
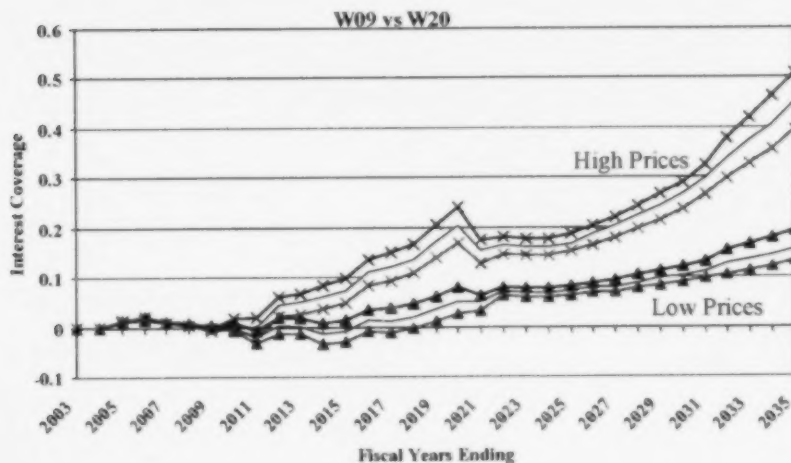




**Figure 2**

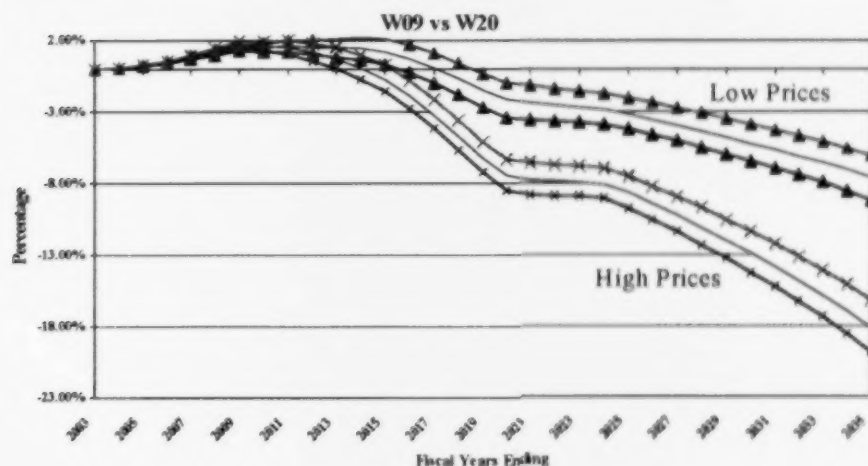
Sensitivity to +15% / -15% Capital Cost  
Impacts of Wuskwatim Advancement on  
Manitoba Hydro's Interest Coverage



- 1 The advancement of Wuskwatim coupled with higher capital costs would not adversely affect
- 2 Manitoba Hydro's financial stability. Changes to the Corporation's debt ratio relative to the base
- 3 case are shown in **Figure 3**. A 15% increase in capital costs, increases the debt ratio by no more
- 4 than 2.1% over the 2020 base case. Even under low export prices, the debt ratio would recover to
- 5 the same level as the base case by 2019.

Figure 3

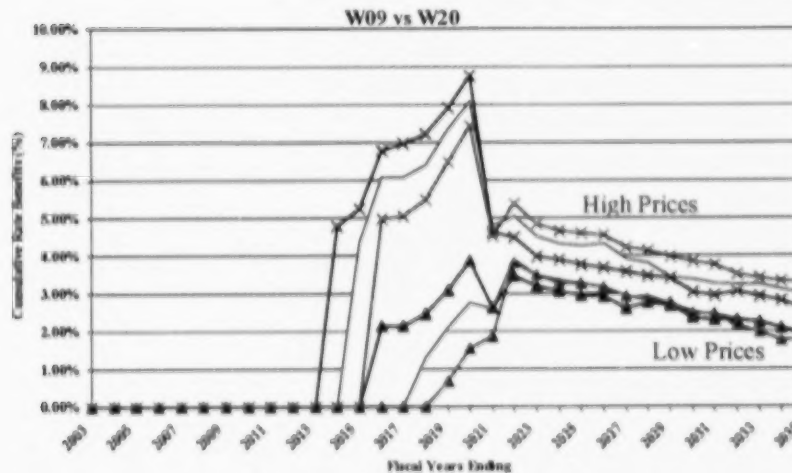
Sensitivity to +15% / -15% Capital Cost  
Impacts of Wuskwatim Advancement on Manitoba Hydro's Debt Ratio



1 **Figures 4 and 5** show the potential cumulative percent customer rate benefits and present value  
2 of customer bill benefits. As in other financial scenarios, rates with Wuskwatim 2009 are held  
3 constant until the same level of debt ratio is attained relative to the corresponding 2020 base  
4 case. Once this has been achieved, the potential rate benefits are calculated by applying the same  
5 1.15 annual interest coverage target in both cases. As expected, the lower capital cost scenarios  
6 yield the higher rate benefits to customers during the advancement period. In the Wuskwatim  
7 2009 case, the long-term rate benefits are project to range from 1.8% to 3.3% under the various  
8 capital scenarios compared to 1.9% to 3.0% using the base capital costs.

**Figure 4**

Sensitivity to +15% / -15% Capital Cost  
Impacts of Wuskwatim Advancement on Customer Rates



- 1 **Figure 5** shows the relative value of higher cumulative rate benefits during the advancement  
2 period versus at the end of the study period. On a present value basis, the advancement of  
3 Wuskwatim could yield cumulative reductions to customers' bills ranging from \$87 to \$216  
4 million by 2035. Changes in capital cost widen this range by \$14 million for low export prices  
5 and \$25 million for high export prices.

Figure 5

Sensitivity to +15% / -15% Capital Cost  
Impacts of Wuskwatim Advancement on Customer Bills



- 1 The advancement of Wuskwatim to 2009 is still positive for Manitoba Hydro even with a  
2 hypothetical 15% increase in the cost of the generating station and in the related transmission  
3 facilities from the amounts which are currently expected. The small increase to the Corporation's  
4 debt ratio of 2.1% resulting from the advancement of Wuskwatim under a scenario of with  
5 higher capital costs is only slightly higher than the 1.6% increase in the main submission with  
6 base capital costs, and will not impair Manitoba Hydro's financial stability nor require offsetting  
7 customer rate increases to cover the start-up costs. Higher capital costs result in a deferral of rate  
8 benefits to customers by no more than one year compared to the base capital cost scenarios.  
9 However, even when higher capital costs are combined with low export prices, rate benefits are  
10 projected to be achievable prior to the 2020 in-service and continue over the long-term.

1 **CCC-NFAAT-S-10**

2

3 **FINANCIAL IMPACT OF 2003 POWER RESOURCE PLAN UPDATE**

4

5 **Request:** The Crown Corporations Council requested an updated financial analysis resulting  
6 from updated data and assumptions assumed in the 2003 Power Resource Plan.

7

8 **Response:** To be filed at a later date when available.

August 08, 2003

CAC/MSOS/NFAAT/S/10

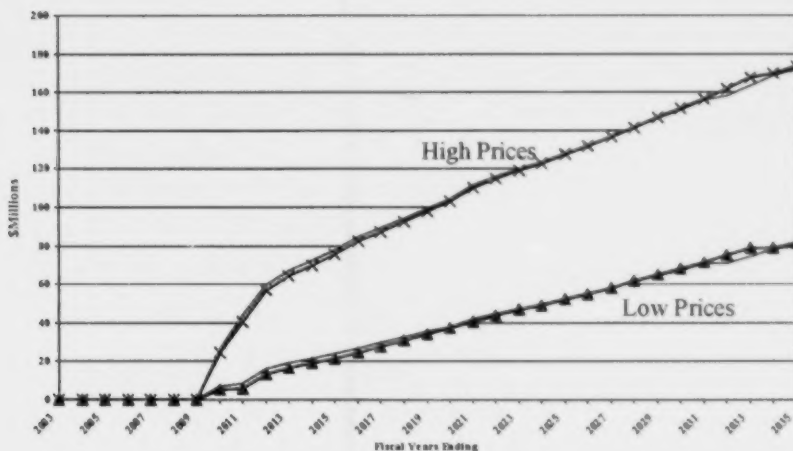
IMPACT OF PARTNERSHIP DIVIDEND POLICY ON MANITOBA HYDRO

**Request:** CAC/MSOS asked how dividend policy could be utilized to provide for capital reserves.

**Response:** Figure 7.1 of the NFAAT filing (Chapter 7) showed the range of annual dividends anticipated to flow to the Partners from the Project if all cash is paid out beyond that which is required to maintain a debt ratio of 75%. Figure 1 below indicates the slightly smaller payments projected to be received by the Partners if dividends are limited to net income. (The Partners may decide to base dividends on all or a proportion of net income in order to build up reserves for future capital contingencies.) In this event the equity ratio in the Partnership would rise above 25% (to 40% by 2035 if no unexpected capital requirements occur.)

Figure 1

Wuskwatim Partnership Dividends  
2009 In-Service



1 The amount of cash paid out as dividends versus that which is retained in the Partnership does  
2 not affect Manitoba Hydro's own financial statements due to the elimination of offsetting entries  
3 described in the response to consolidation accounting (CCC/NFAAT/S/8).

4  
5 The net effect on Manitoba Hydro's debt/equity position is as shown in **Figure 7.4** of the main  
6 filing. This result will not differ even if the Partnership decides to pay out lower dividends in  
7 order to create additional capital reserves. This is because, under consolidation accounting, the  
8 full amount of Manitoba Hydro's 67% share in the net income of the Partnership will be  
9 allocated to the Corporation regardless of dividend payouts. Dividends to the parent company are  
10 eliminated upon consolidation. Manitoba Hydro will make provision for future contingencies in  
11 the Project and elsewhere in the Corporation through its normal equity ratio and self-insurance  
12 policies. (Establishment of capital reserves within the Partnership may be more of a benefit to  
13 NCN in limiting the need for future unanticipated cash calls.

**CAC/MSOS/NFAAT/S/11**

**SUMMARIZED PARTNERSHIP PROJECTED INCOME STATEMENTS**

**Request:** CAC/MSOS requested that simplified statements be provided for the Partnership.

**Response:** See Attachments CAC/MSOS/NFAAT/S/11a Tables A.25 to A.28.



ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.25

Wuskwatim 2009 Low Export Price Scenario

PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP  
(x 1,000,000)

For year ending March 31

|                         | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 58   | 84   | 86   | 89   | 91   | 93   | 95   | 97   | 100  | 102  |
|                         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 58   | 84   | 86   | 89   | 91   | 93   | 95   | 97   | 100  | 102  |
| <b>EXPENSES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 24   | 42   | 41   | 40   | 40   | 39   | 39   | 38   | 37   | 37   |
| Other Operating         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 28   | 37   | 32   | 32   | 32   | 32   | 33   | 33   | 33   | 33   |
|                         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 53   | 79   | 73   | 73   | 72   | 72   | 71   | 71   | 70   | 70   |
| Net Income (Loss)       | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 5    | 6    | 13   | 16   | 18   | 21   | 24   | 27   | 30   | 33   |
| Dividends               | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 7    | 10   | 14   | 19   | 21   | 24   | 27   | 30   | 32   | 36   |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | N/A  | N/A  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | N/A  | N/A  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.14 | 1.13 | 1.32 | 1.40 | 1.46 | 1.53 | 1.62 | 1.70 | 1.79 | 1.89 |

**ATTACHMENT CAC/MSOS/NFAAT/5/11a Table: A.25 (Cont'd)**

Wuskwatim 2009 Low Export Price Scenario

PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP  
(x 1,000,000)

For year ending March 31

|                         | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 105  | 108  | 110  | 112  | 113  | 116  | 118  | 121  | 123  | 126  | 128  | 131  | 134  | 137  | 139  | 141  |
|                         | 105  | 108  | 110  | 112  | 113  | 116  | 118  | 121  | 123  | 126  | 128  | 131  | 134  | 137  | 139  | 141  |
| <b>EXPENSES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 36   | 36   | 35   | 34   | 34   | 33   | 32   | 32   | 31   | 30   | 30   | 29   | 32   | 31   | 30   | 29   |
| Other Operating         | 33   | 33   | 33   | 33   | 33   | 33   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 35   |
|                         | 69   | 69   | 68   | 68   | 67   | 66   | 66   | 65   | 65   | 64   | 64   | 63   | 66   | 65   | 64   | 64   |
| Net Income (Loss)       | 36   | 39   | 42   | 45   | 46   | 50   | 52   | 55   | 59   | 62   | 65   | 68   | 68   | 72   | 75   | 77   |
| Dividends               | 38   | 42   | 45   | 47   | 49   | 52   | 55   | 58   | 61   | 64   | 67   | 71   | 71   | 74   | 78   | 80   |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | 1.98 | 2.09 | 2.19 | 2.30 | 2.38 | 2.50 | 2.61 | 2.75 | 2.89 | 3.03 | 3.19 | 3.35 | 3.16 | 3.33 | 3.51 | 3.66 |

ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.26

Wuskwatim 2020 Low Export Price Scenario

PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP  
(x 1,000,000)

For year ending March 31

|                   | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| REVENUES          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue       | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| EXPENSES          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Other Operating   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Net Income (Loss) | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Dividends         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Financial Ratios  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio        | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 1.00 | 1.00 | 1.00 | 1.00 |

**ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.26 (Cont'd)**

**Wuskwatim 2020 Low Export Price Scenario**

**PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP**  
(x 1,000,000)

For year ending March 31

|                         | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 0    | 77   | 110  | 112  | 113  | 116  | 118  | 121  | 123  | 126  | 128  | 131  | 134  | 137  | 139  | 141  |
|                         | 0    | 77   | 110  | 112  | 113  | 116  | 118  | 121  | 123  | 126  | 128  | 131  | 134  | 137  | 139  | 141  |
| <b>EXPENSES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 0    | 31   | 54   | 54   | 53   | 52   | 51   | 51   | 50   | 49   | 48   | 47   | 47   | 46   | 45   | 44   |
| Other Operating         | 0    | 33   | 41   | 41   | 41   | 41   | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 43   | 43   |
|                         | 0    | 63   | 95   | 95   | 94   | 94   | 93   | 92   | 92   | 91   | 90   | 90   | 89   | 88   | 88   | 87   |
| Net Income (Loss)       | 0    | 13   | 15   | 17   | 19   | 22   | 25   | 28   | 32   | 35   | 38   | 42   | 45   | 48   | 52   | 54   |
| Dividends               | 0    | 15   | 18   | 21   | 23   | 26   | 29   | 32   | 35   | 38   | 42   | 44   | 48   | 52   | 55   | 58   |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | 1.00 | 1.25 | 1.27 | 1.32 | 1.36 | 1.43 | 1.49 | 1.56 | 1.63 | 1.71 | 1.79 | 1.87 | 1.96 | 2.05 | 2.15 | 2.22 |

**ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.27**

**Wuskwatim 2009 High Export Price Scenario**

**PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP**  
(x 1,000,000)

For year ending March 31:

|                         | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 77   | 118  | 129  | 136  | 140  | 146  | 152  | 156  | 160  | 165  |
|                         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 77   | 118  | 129  | 136  | 140  | 146  | 152  | 156  | 160  | 165  |
| <b>EXPENSES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 24   | 41   | 40   | 39   | 39   | 38   | 37   | 37   | 36   | 35   |
| Other Operating         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 28   | 37   | 32   | 32   | 32   | 32   | 33   | 33   | 33   | 33   |
|                         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 52   | 78   | 72   | 72   | 71   | 71   | 70   | 69   | 69   | 68   |
| Net Income (Loss)       | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 25   | 41   | 57   | 64   | 69   | 75   | 82   | 87   | 91   | 96   |
| Dividends               | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 26   | 43   | 60   | 67   | 72   | 78   | 84   | 89   | 94   | 99   |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | N/A  | N/A  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | N/A  | N/A  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.63 | 1.99 | 2.42 | 2.63 | 2.79 | 2.97 | 3.18 | 3.35 | 3.53 | 3.73 |

**ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.27 (Cont'd)**

**Wuskwatim 2009 High Export Price Scenario**

**PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP  
(x 1,000,000)**

For year ending March 31:

|                         | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 170  | 176  | 180  | 183  | 186  | 190  | 193  | 198  | 202  | 206  | 210  | 214  | 219  | 223  | 228  | 231  |
|                         | 170  | 176  | 180  | 183  | 186  | 190  | 193  | 198  | 202  | 206  | 210  | 214  | 219  | 223  | 228  | 231  |
| <b>EXPENSES</b>         |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 35   | 34   | 33   | 33   | 32   | 31   | 31   | 30   | 29   | 28   | 28   | 27   | 30   | 29   | 28   | 27   |
| Other Operating         | 33   | 33   | 33   | 33   | 33   | 33   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 34   | 35   |
|                         | 68   | 67   | 67   | 66   | 65   | 65   | 64   | 64   | 63   | 62   | 62   | 61   | 64   | 63   | 62   | 62   |
| Net Income (Loss)       | 102  | 109  | 113  | 117  | 121  | 125  | 129  | 134  | 139  | 143  | 148  | 153  | 155  | 160  | 166  | 170  |
| Dividends               | 104  | 111  | 116  | 120  | 123  | 128  | 132  | 137  | 142  | 146  | 150  | 156  | 158  | 163  | 168  | 172  |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | 3.94 | 4.19 | 4.38 | 4.58 | 4.76 | 4.99 | 5.21 | 5.47 | 5.75 | 6.04 | 6.34 | 6.66 | 6.24 | 6.58 | 6.95 | 7.27 |

ATTACHMENT CAC/MSOS/NFAAT/S/11a Table: A.28

Wuskwatim 2020 High Export Price Scenario

PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP  
(x 1,000,000)

For year ending March 31

|                   | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| REVENUES          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue       | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
|                   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| EXPENSES          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Other Operating   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
|                   | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Net Income (Loss) | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Dividends         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Financial Ratios  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio        | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | 1.00 | 1.00 | 1.00 | 1.00 |

**ATTACHMENT CAC/MSOS/NFAAT/5/11a Table: A.28 (Cont'd)**

**Wuskwatim 2020 High Export Price Scenario**

**PROJECTED OPERATING STATEMENT WUSKWATIM PARTNERSHIP**  
(x 1,000,000)

For year ending March 31:

|                         | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>REVENUES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Net Revenue             | 0    | 125  | 180  | 183  | 186  | 190  | 193  | 198  | 202  | 206  | 210  | 214  | 219  | 223  | 228  | 231  |
|                         | 0    | 125  | 180  | 183  | 186  | 190  | 193  | 198  | 202  | 206  | 210  | 214  | 219  | 223  | 228  | 231  |
| <b>EXPENSES:</b>        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Finance Expense         | 0    | 29   | 53   | 52   | 51   | 51   | 50   | 49   | 48   | 47   | 46   | 45   | 45   | 44   | 43   | 42   |
| Other Operating         | 0    | 33   | 41   | 41   | 41   | 41   | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 43   | 43   |
|                         | 0    | 62   | 94   | 93   | 93   | 92   | 91   | 91   | 90   | 89   | 88   | 88   | 87   | 86   | 86   | 85   |
| Net Income (Loss)       | 0    | 63   | 86   | 90   | 93   | 98   | 102  | 107  | 112  | 117  | 122  | 127  | 132  | 137  | 142  | 146  |
| Dividends               | 0    | 65   | 89   | 94   | 97   | 102  | 106  | 111  | 116  | 120  | 125  | 130  | 135  | 141  | 146  | 150  |
| <b>Financial Ratios</b> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Debt Ratio              | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  | 75%  |
| Interest Coverage       | 1.00 | 2.23 | 2.62 | 2.73 | 2.82 | 2.94 | 3.05 | 3.19 | 3.33 | 3.47 | 3.62 | 3.78 | 3.94 | 4.12 | 4.31 | 4.47 |



CCC/NFAAT/S/11

**Request:** General Comments, provide updates to key documents. Page 1 of Crown Corporation Council letter dated June 27, 2003.

**Response:** The updates to the following key documents have been included in the appendices:

Appendix 2: Current Strategic Plan 2003/04

Appendix 4: Newsletter #4

Appendix 7: Economic Outlook 2003-2004

Appendix 8: System Load Forecast 2003/04 to 2023/24

NOTABLE CHANGES

**Appendix 2: Corporate Strategic Plan 2003/04**

The first nine goals represented in the 2003/04 CSP are unchanged from last year and reflect a focus on competing effectively in today's business environment and to being a responsible corporate citizen. The 2003/04 CSP introduces the tenth corporate goal, which is "Be a leader in implementing cost-effective energy conservation and alternate energy programs." This new goal provides more focus on Manitoba Hydro's efforts to provide customers with a full spectrum of energy and energy conservation solutions. (Refer to CCC/NFAAT/S/12)

**Appendix 4: Newsletter #4 - Fourth Round of Public Involvement.**

Since the last round of public involvement during mid-winter, separate Environmental impact Statements for the Wuskwatim Generating Project and Wuskwatim Transmission Project have been prepared as well as a report that considers the need for and alternatives to the Wuskwatim Project. The Government of Manitoba has provided a Terms of Reference to the Clean Environment Commission (CEC) to conduct a public review of these documents.

The newsletter goes on to provide an overview of the documents submitted. (Refer to CCC/NFAAT/S/13)

August 08, 2003

1   **Appendix 7: Economic Outlook 2003**

2   Key changes - The results of the key variables in the 2003 Economic Outlook are similar to those  
3   in the 2002 Economic Outlook and therefore, would not have a significant impact on the  
4   Wuskwatim analysis. Please refer to Page 2 of the 2003 Economic Outlook for a comparison of  
5   the key variables. (Refer to CCC/NFAAT/S/14)

6

7   **Appendix 8: System Load Forecast 2003/04 to 2023/24**

8   The most significant change in the forecast compared to last year's forecast is significantly  
9   higher load in the future. This has implications on the Power Resource Plan including an  
10   advancement of plant. The load actually experienced in 2002/03 was higher than contained in the  
11   previous forecast. Net Firm Energy over the forecast period has increased from the previous  
12   forecast over the five (1039 GWh), ten (752 GWh) and twenty (1055 GWh) year intervals into  
13   the future. This increase is mainly due to higher expected loads in the Residential, General  
14   Service and Transmission Losses categories.

15

16   The Net Total Peak over the forecast period has increased from the previous forecast over the  
17   five (181 MW), ten (132 MW) and twenty (179 MW) year intervals into the future.

18

19   The other significant change to the forecasting process resulted from the purchase of Winnipeg  
20   Hydro. In previous forecasts, the Winnipeg Hydro load was forecasted at the Common Bus level.  
21   This year, the load is forecasted at the sales level.

22

23   Separate econometric forecasts were prepared for Winnipeg Hydro customers in the Residential  
24   Standard, Residential All-electric and General Service Mass Market classification. The sales  
25   forecasts contained in this document represent all Manitoba Customers. The results were  
26   calculated by adding the Manitoba Hydro and Winnipeg Hydro forecasts together.

27

28   Of note is the load growth over the previous 20 years, which amounts to a 52% increase, while  
29   the population growth over the same period has increased only 8.5% over the same period. This

- 1 indicates a past trend of load growth increasing at a greater rate than population growth over the
- 2 same time. (Refer to CCC/NFAAT/S/15)

August 08, 2003

1 CCC/NFAAT/S/12

2

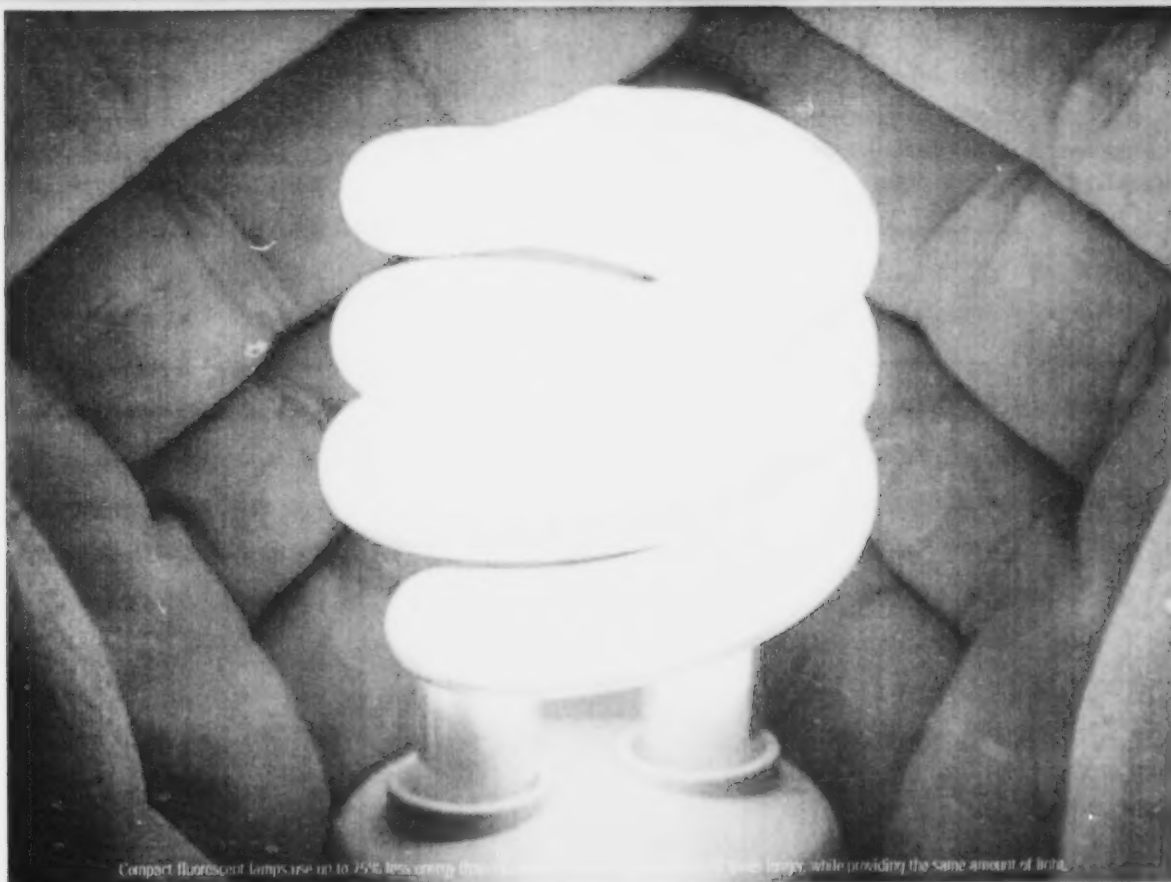
3 **Provide current Corporate Strategic Plan**

4

5 The Corporate Strategic Plan 2003 2004 "Powerful Solutions" is attached. (see

6 CCC/NFAAT/S/11 for comparison)

August 08, 2003



Compact fluorescent lamps use up to 75% less energy than incandescent bulbs, last up to 10 times longer, while providing the same amount of light.

# POWERFUL SOLUTIONS

THE CORPORATE STRATEGIC PLAN 2003 | 2004

Manitoba Hydro's Vision of the Future



"Be a leader in implementing cost-effective energy conservation and alternative energy programs."

Since the Corporate Strategic Plan was first introduced to employees in its official, published form four years ago, it has proven to be a highly successful communications tool – both for our staff and our stakeholders. I'm always encouraged to see employees referring to the CSP in their daily business lives, at meetings, and in general discussions. In those situations it becomes clear to me that the document is achieving its intended purpose – to serve as the framework, or constitution, for all of Manitoba Hydro's present and future activities.

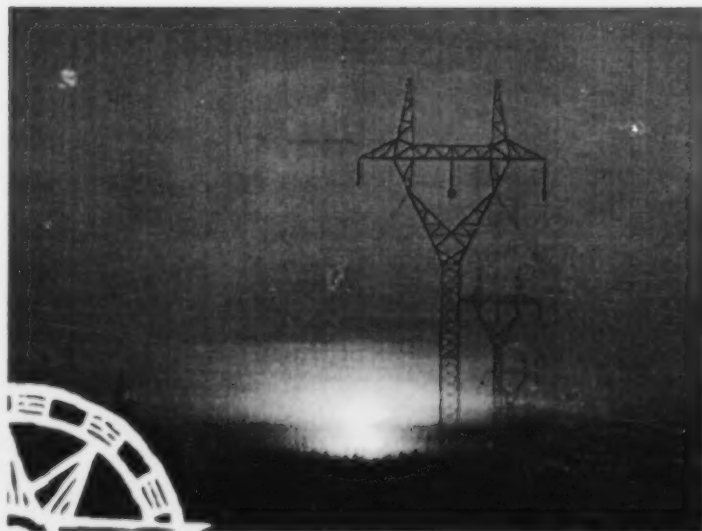
I've also been asked many times if the information published in the CSP is meant to represent all of the activities of the company. It's important to make the distinction that the CSP is intended to provide employees with the strategic direction that represents the things we stand for, our most important corporate goals, and the strategies and targets necessary to achieve them. The CSP can then be translated into business plans across the organization at the business unit, division, and department levels. The CSP clearly does not represent the bulk of the operational work that employees perform every day – but you should be able to trace the work you do back to the core elements contained in the CSP and, ultimately, our vision of being the best utility in North America.

Last year was once again a historic one for Manitoba Hydro. With the acquisition of Winnipeg Hydro we added over 500 more employees to our workforce. The synergies that have occurred as a result will greatly benefit the citizens of Winnipeg, and all Manitobans, through more streamlined operations. We are now, very literally, the one-stop energy services provider for all of Winnipeg and Manitoba.

The first nine corporate goals represented in the 2003/04 CSP are unchanged from last year and reflect a focus on managing effectively in today's business environment and being a responsible corporate citizen. The 2003/04 CSP also introduces the 10<sup>th</sup> corporate goal, which is to "Be a leader in implementing cost-effective energy conservation and alternative energy programs." This new goal provides more focus on our efforts to provide customers with a full spectrum of energy and energy conservation solutions. As a living document, the CSP also gives us the flexibility to succeed across a wide range of possible futures.

Through the basic commodities and services of electricity and natural gas, Manitoba Hydro is a vital contributor to all aspects of life in the province. I'm incredibly proud of our company and its achievements – I know the future promises to be an exciting and challenging one. I'm confident that our employees will continue to do what they've always done – take personal responsibility for their own contributions and embrace these new challenges head on.

**Bob Brennan**, President and CEO

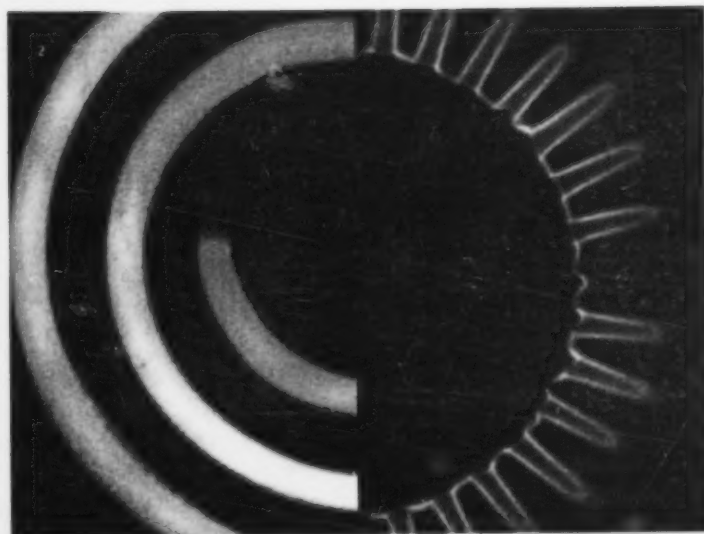


## VISION

To be recognized as the best utility in North America with respect to safety, rates, reliability, customer satisfaction, and environmental management, and to be considerate of all people with whom we have contact.

## MISSION

To provide for the continuance of a supply of energy adequate for the needs of the province, to promote economy and efficiency in the development, generation, transmission, distribution, supply, and end-use of energy, and to market energy services within and outside the province.



## OPERATING PRINCIPLES

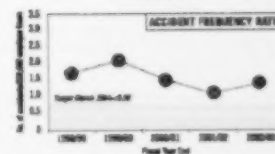
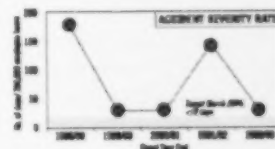
- Work together for the success of the organization as a whole, recognizing that all our activities are interrelated.
- Establish long-term, cooperative relationships with all employees, customers, suppliers, and other stakeholders, aimed at achieving our shared Vision.
- Create a working environment that removes barriers to effective performance and which fosters mutual respect, trust, and open communication.
- Provide opportunities for all employees to develop their full potential, recognizing people's inherent desire to do their best.
- Measure outcomes, develop an understanding of the causes of variation from planned performance, and take appropriate action.
- Practise continuous improvements through ongoing coaching, learning, and innovation, focused on the needs and wants of internal and external customers.

## MANITOBA HYDRO GOAL

### CONTINUOUSLY IMPROVE SAFETY IN THE WORK ENVIRONMENT

Safety continues to be the Corporation's first priority and most important goal. Manitoba Hydro is committed to protecting its employees from personal injury and occupational illness by providing and maintaining the highest standard of safety and health in the workplace. Safety programs are constantly being improved to provide employees with the most comprehensive direction and guidance to ensure a safe and hazard-free work environment.

| MEASURE                 | TARGET                                    | STRATEGIES                                                        |
|-------------------------|-------------------------------------------|-------------------------------------------------------------------|
| High-risk accidents     | 0                                         | Ensure adherence to the Corporation-wide Safety Management System |
| Accident severity rate  | < 16.0 days per 100,000 hours worked      | Improve the behaviour based safety program                        |
| Accident frequency rate | < 0.80 accidents per 100,000 hours worked |                                                                   |







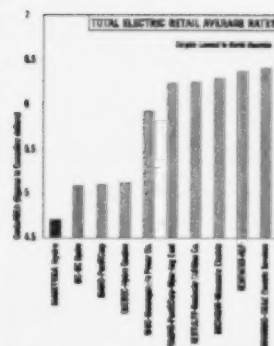
## MANITOBA HYDRO GOAL

**PROVIDE CUSTOMERS WITH EXCEPTIONAL VALUE**  
(rates, service, public safety, reliability, and power quality)

Manitoba Hydro has consistently maintained electrical rates among the lowest in North America while delivering environmentally friendly, renewable energy from its hydroelectric generation. The Corporation's public safety, reliability, and power quality continue to rank high among Canada's power supply leaders.

Since July 1999, Manitoba Hydro has been the province's major distributor of natural gas, providing safe, dependable natural gas service to more than 250,000 of its customers.

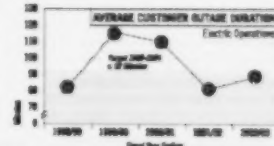
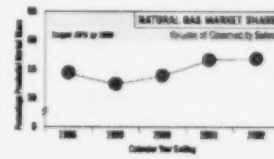
| MEASURE                                    | TARGET                                                    | STRATEGIES                                                                                                                                           |
|--------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Retail Rates, Electricity                  | Lowest in North America                                   | Anticipate customer expectations, and pursue opportunities to increase customer value and reduce costs                                               |
| Retail Distribution Rates, Natural Gas     | Among the lowest in North America                         |                                                                                                                                                      |
| Average Electric Customer Outage Time      | ≤ 92 minutes Cumulative Average (2000-04)                 | Develop energy marketing plan including energy options                                                                                               |
| Average Electric Customer Outage Frequency | ≤ 1.3 per year Cumulative Average (2000-04)               | Pursue replacement of economically feasible natural gas distribution                                                                                 |
| CEA Customer Service Index                 | Best in Canada                                            | Develop natural gas commodity pricing products and service levels                                                                                    |
| Public Contacts (natural gas and electric) | 20% equity reduction                                      | Continue to deliver effective and innovative public safety programs that target safety issues with respect to the use of electricity and natural gas |
| Natural gas market share                   | 100% of new franchisees<br>90% of commodity sales by 2005 |                                                                                                                                                      |



The lowest cost utilities in North America  
Source: Electric Utilities Association, January 1, 2005



\*Source: Canadian Electricity Association Public Affairs Committee, January 1, 2005





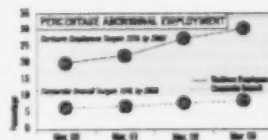


## MANITOBA HYDRO GOAL

### BE A LEADER IN STRENGTHENING WORKING RELATIONSHIPS WITH ABORIGINAL PEOPLES

The commitment of Manitoba Hydro to strengthen its Aboriginal relationships provides critical leadership in the resource and corporate sector by identifying and supporting the positive capacity of the Aboriginal communities in Manitoba. A critical component of a company's competitive advantage lies with the strength and capabilities of its employees. A rapidly increasing Aboriginal labour force offers excellent opportunities to recruit Aboriginal employees at various levels throughout the Corporation.

| MEASURE                                                                   | TARGET      | STRATEGIES                                                                                                                                                                                                       |
|---------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| % of impacted Aboriginal communities with a suitable management framework | 100%        | <ul style="list-style-type: none"> <li>Coordinate the implementation of Aboriginal policies throughout the Corporation</li> <li>Facilitate and manage ongoing negotiations from pilot development</li> </ul>     |
| % Aboriginal Employment                                                   |             | <ul style="list-style-type: none"> <li>Increase employment opportunities at Manitoba Hydro for Aboriginal peoples</li> <li>Continue to enhance training and support programs for Aboriginal employees</li> </ul> |
| Corporate overall                                                         | 10% by 2005 |                                                                                                                                                                                                                  |
| Northern                                                                  | 11% by 2005 | <ul style="list-style-type: none"> <li>Provide and pursue business relationships with Aboriginal companies and with companies who employ Aboriginal peoples</li> </ul>                                           |

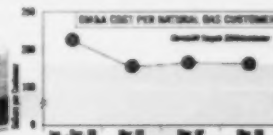
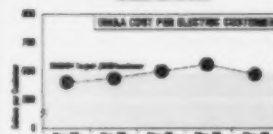
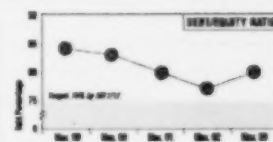


## MANITOBA HYDRO GOAL

### IMPROVE CORPORATE FINANCIAL STRENGTH

Achieving its financial targets is the key to economic well-being at Manitoba Hydro. Maintaining low rates and high reliability, while being responsive to new economic opportunities, are high priorities for the Corporation.

| MEASURE                                | TARGET                          | STRATEGIES                                                                                                                                                                                                              |
|----------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interest Coverage                      | > 1.10                          | <ul style="list-style-type: none"> <li>Continue to reduce the mature portions of debt to fixed assets</li> </ul>                                                                                                        |
| Delinquency rate                       | 75/25 by the year 2011/12       | <ul style="list-style-type: none"> <li>Implement corporate e-business opportunities</li> </ul>                                                                                                                          |
| Capital financing ratio                | > 1.0                           | <ul style="list-style-type: none"> <li>Leverage technology to reduce costs</li> </ul>                                                                                                                                   |
| Cost per customer (EMIA) - Electric    | \$400 per customer (March 2004) | <ul style="list-style-type: none"> <li>Continue to achieve savings associated with the acquisition of Winnipeg Hydro</li> </ul>                                                                                         |
| Cost per customer (EMIA) - Natural Gas | \$250 per customer (March 2004) | <ul style="list-style-type: none"> <li>Improve product mix performance measurement</li> <li>Streamline units against other low cost service providers</li> <li>Continuous implementation of variable pricing</li> </ul> |



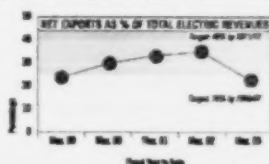


## MANITOBA HYDRO GOAL

### MAXIMIZE EXPORT POWER NET REVENUES

Strong export revenues allow for low, reliable, electricity rates which benefit individuals and businesses in Manitoba by helping keep costs down. Low rates give Manitoba businesses a cost advantage over their competition in other provinces and countries.

| MEASURE                                           | TARGET                           | STRATEGIES                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Net Export Revenue as % of Total Electric Revenue | 30% in 2000/01<br>40% in 2011/12 | Aggressively pursue export sales and protect ex-warehouse sales for future plans.<br>Continue being a Canadian leader in U.S. market access.<br>Expand the transmission capacity to support export markets.<br>Influence international industry restructuring and maintain flexibility to adapt as appropriate.<br>Promote new hydro and/or transmission as part of the Canadian solution to climate change. |



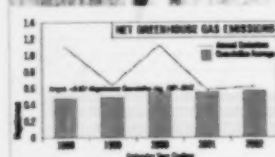
## MANITOBA HYDRO GOAL

### HAVE HIGHLY SKILLED, EFFECTIVE, INNOVATIVE EMPLOYEES AND A DIVERSE WORKFORCE THAT REFLECTS THE DEMOGRAPHICS OF MANITOBA

Without the dedication, effort, and skill of a highly trained workforce none of our goals could be accomplished. The acquisitions of Centra Gas and Winnipeg Hydro have added to Manitoba Hydro's skilled group of energy professionals. Simply put, the staff at Manitoba Hydro are second to none and the utility continues to attract, develop, and retain skilled workers from the highly diverse population in Manitoba.

| MEASURE                                                            | TARGET                                                                                                                     | STRATEGIES                                                                                                                                                                                                                         |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Percentage of non-entry positions filled by external applicants    | Range 8% - 12%                                                                                                             | Continue staff development to meet long strategic and operational positions.                                                                                                                                                       |
| Percentage of designated group members in Manitoba Hydro workforce | Women: 4%<br>Women in Mgmt: 12%<br>Women Professionals: 25%<br>Persons with Disabilities: 4.6%<br>Visible Minorities: 3.8% | Recruit, develop and retain members of designated groups.<br>Ensure appropriate resource allocation to meet workload needs.<br>Encourage team approach to family work and community.<br>Enhance the employee recruitment strategy. |





## MANITOBA HYDRO GOAL

### BE AN OUTSTANDING CORPORATE CITIZEN

As a corporate citizen, Manitoba Hydro is committed to making a positive contribution toward improving the quality of life enjoyed by Manitobans. Besides powering the province with electricity and providing natural gas services, Manitoba Hydro proudly supports public safety, education, sponsorship of events, and many community initiatives.

| MEASURE                                    | TARGET | STRATEGIES                                                                                                                                               |
|--------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSA Public Attitude Index                  | ≥ 6.5  | Continue to take a leadership role in community activities and support programs.                                                                         |
| Manitoba Hydro Corporate Citizenship Index | ≥ 6.2  | Encourage and support staff participation in community activities.<br>Continue to deliver effective and innovative public education and safety programs. |



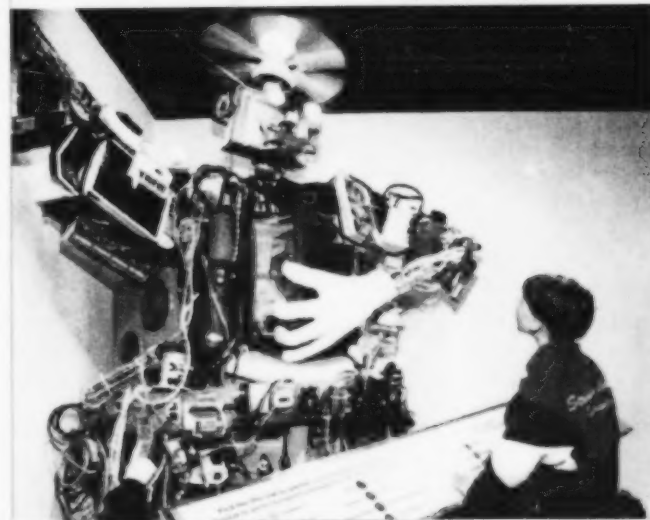
Manitoba Hydro's commitment to public safety and education is evident in its many community initiatives.

## MANITOBA HYDRO GOAL

### BE PROACTIVE IN PROTECTING THE ENVIRONMENT AND BE A RECOGNIZED LEADER IN DOING SO

Manitoba Hydro is committed to sustaining a diverse and healthy environment for present and future Manitobans by maintaining a high standard of environmental responsibility. The Corporation plans to integrate climate change management into its plans and operations. This is consistent with our environmental management policy and principles of sustainable development, including a practical preference for renewable resources, encouragement of efficient resource use and recognition of our global responsibility.

| MEASURE                                               | TARGET                                                                                                                            | STRATEGIES                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental component of CSA Customer Service Index | ≥ 0.5                                                                                                                             | Complete and meet an ISO corporate certification.                                                                                                                                                                                                                                             |
| Corporate Citizenship Index - environmental component | ≥ 0.8                                                                                                                             | Continue working to improve understanding of Manitoba Hydro's environmental efforts by Manitobans and other provincial customers.                                                                                                                                                             |
| Net Green House Gas Emissions                         | Continue to reduce net emissions (1990-2012 17% below 1990 levels) (in 2012 negotiations for electric and natural gas operations) | Continue to develop & implement a plan for compliance with anticipated changes in federal PGG regulations.                                                                                                                                                                                    |
| ISO 14001 Corporate Certification                     | Achieve & Maintain                                                                                                                | Continue to provide input in the development of new environmental regulatory requirements. Ensure compliance with the requirements of the Sustainable Development Act. Be a leader in contributing to effective climate change solutions. Improve employee knowledge of environmental issues. |



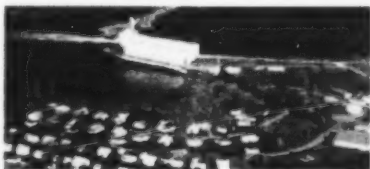


## MANITOBA HYDRO GOAL

### PROACTIVELY SUPPORT AGENCIES RESPONSIBLE FOR BUSINESS DEVELOPMENT IN MANITOBA

As a world leader in harnessing hydroelectric resources, Manitoba Hydro works together with government and the private sector to create an economic environment that is conducive to developing new ideas and ways of doing business.

| MEASURE             | TARGET         | STRATEGIES                                                                                                                                                                                                                        |
|---------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agency satisfaction | 100% satisfied | Be proactive in working with economic development agencies to maximize wealth and jobs in Manitoba for each new MW of industrial demand.<br>Partner with customers with respect to their energy cost structures and productivity. |



## MANITOBA HYDRO GOAL

### BE A LEADER IN IMPLEMENTING COST EFFECTIVE ENERGY CONSERVATION AND ALTERNATIVE ENERGY PROGRAMS

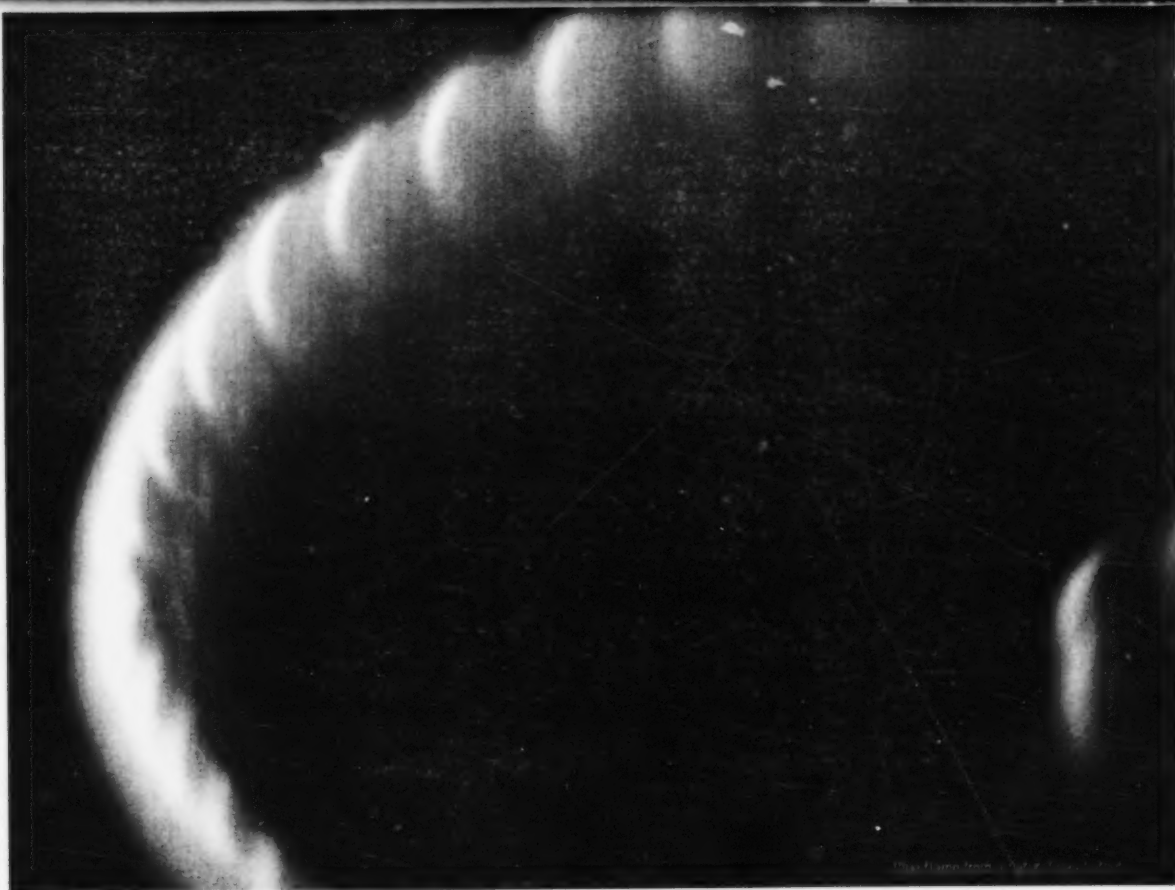
Whether you have natural gas, electricity, or both, being Power Smart™ saves you money. Manitoba Hydro programs provide a broad array of educational materials, ranging from how to retrofit a home to energy efficient products and practices. These programs also provide financial assistance to customers making home efficiency improvements. Hydro also works with commercial and industrial customers to improve their electrical and gas energy efficiency and their business processes.

Manitoba Hydro is undertaking initiatives to address opportunities provided by emerging energy related technologies. Alternative energy programs will provide new economic opportunities to provide energy resources in a cost effective way.

\*Manitoba Hydro is a member of the efficient 2000.

| MEASURE                                       | TARGET                | STRATEGIES                                                                                                                                                                                                                                                  |
|-----------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OTM - GWh saved                               | 600 GWh by March 2004 | Aggressively promote Power Smart programs.                                                                                                                                                                                                                  |
| OTM - MW saved (in winter peak)               | 100 MW by March 2004  | Disseminate feasibility and economics of wind generating technology in Manitoba.                                                                                                                                                                            |
| Alternative Capacity installed (or delivered) | Under review          | Work with potential Independent Power Producers (IPPs) and customers to encourage development of innovative alternative energy solutions.<br>Continue to research and monitor technological and economical developments in all energy related technologies. |





 **Manitoba  
Hydro**



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TEL: 204.474.4169 FAX: 204.474.4276 [www.hydro.mb.ca](http://www.hydro.mb.ca)

1

CCC/NFAAT/S/13

2

3 **Provide Nisichawayasihk Cree Nation Newsletter #4**

4

5 Nisichawayasihk Cree Nation Newsletter #4 is attached. (see CCC/NFAAT/S/11 for  
6 comparison)

August 08, 2003



## PROPOSED WUSKWATIM GENERATION AND TRANSMISSION PROJECTS

### Newsletter #4

### - Fourth Round of Public Involvement -

Round Four of public consultation and involvement for the Wuskwatim Generation Project and Wuskwatim Transmission Project addresses the Wuskwatim submissions recently filed with provincial and federal regulators by Manitoba Hydro and the Nisichawayasihk Cree Nation (NCN).

The Wuskwatim Generation Project involves development of a 200 megawatt generating station at Taskinigup Falls on the Burntwood River, and associated access road, construction camp and other infrastructure. The Generation Project is located in the Nelson House Resource Management Area (RMA) southwest of Thompson and southeast of Nelson House. Manitoba Hydro and NCN selected a design for the Project that minimizes the effects on the environment (e.g., selection of a "low head" design).

A separate project, the Wuskwatim Transmission Project, involves development of associated transmission lines and stations to connect the new generating station to the existing Manitoba Hydro transmission system. These transmission facilities extend beyond the Nelson House RMA to Thompson, Snow Lake and The Pas.

Power from the Wuskwatim Generation Project will be available in 2009, several years ahead of projected domestic power needs for Manitobans. By advancing the in-service date from about 2020 to 2009, additional export revenues and profits are possible. The Project will also contribute to reliable power supply for Manitobans, which will be available if domestic growth is higher than expected.

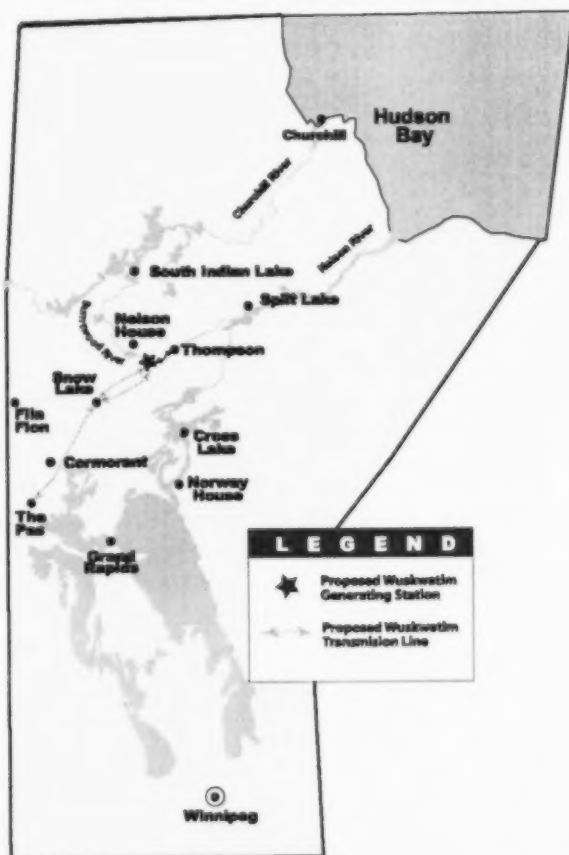
An important feature of the projects has been the involvement of NCN. NCN and Manitoba Hydro have jointly undertaken all of the necessary engineering, environmental, consultation and other related activities associated with the projects. A decision about whether to commence construction of the Wuskwatim projects is expected to be made in December 2003.

Provincial and federal regulatory approvals are needed before any decision to construct can be made. In addition, the Government of Manitoba has requested a "Need For and Alternatives To" review of Manitoba Hydro's proposal to construct and develop the Wuskwatim Generating Station and associated transmission facilities.

No decisions will be made to proceed with the Project pursuant to the current environmental applications until a Project Development Agreement has been completed, voted upon by NCN members, and approved both by NCN and Manitoba Hydro, which is expected by mid-October 2003.

Since the last round of public involvement during mid-winter, separate Environmental Impact Statements (EISs) for the Wuskwatim Generation Project and Wuskwatim Transmission Project have been prepared, as well as a report that considers the need for and alternatives to the Wuskwatim Project. The Government of Manitoba has provided a Terms of Reference to the Clean Environment Commission (CEC) to conduct a public review of these documents.

Further information on the projects and the conclusions from the submissions are summarized in the Integrated Executive Summary of the Environmental Impact Statements and the Project Overview of the *Need for and Alternatives to* report. An overview of the submission documents is provided in this Newsletter.



## What Information has been Filed with Governments?

On April 30, 2003, three separate submissions were made to the federal and provincial regulators:

- Manitoba Hydro submitted the report Submission to the Manitoba Clean Environment Commission: *Need for and Alternatives to the Wuskwatim Project*. This report talks about the reasons that the Wuskwatim Generation Project was selected instead of other alternatives for generating power. The report includes a main volume and a supporting volume.
- Manitoba Hydro and NCN together submitted the report *Wuskwatim Generation Project - Environmental Impact Statement*. This report describes the Project in detail and talks about the anticipated effects of the proposed Generation Project on the physical and biological environment, as well as on people, and includes methods to reduce adverse effects and improve positive effects. It also talks about the effects of this project in combination with others (cumulative effects). The report is large - in addition to the main volume of more than 600 pages, there are 9 supporting volumes covering:
  - Public Consultation and Involvement (Volume 2)
  - Project Description and Evaluation of Alternatives (Volume 3)
  - Physical Environment (Volume 4)
  - Aquatic Environment (Volume 5)
  - Terrestrial Environment (Volume 6)
  - Resource Use (Volume 7)
  - Socio-Economic Environment (Volume 8)
  - Heritage Resources (Volume 9)
  - Cumulative Effects Assessment (Volume 10)
- Manitoba Hydro submitted the report *Wuskwatim Transmission Project - Environmental Impact Statement*. This report describes the Project in detail and talks about the anticipated effects of the proposed Transmission Project on the physical and biological environment, as well as on people, and includes methods to reduce adverse effects and improve positive effects. The report also describes the process through which the routes for the transmission lines were selected, and reviews effects of this project in combination with other projects (cumulative effects). This report is large as well - in addition to the main volume of more than 500 pages, there are 7 supporting volumes covering:
  - Terrain Analysis and Ecological Land Classification (Volume 2)
  - Aquatic Environment (Volume 3)
  - Wildlife Environment (Volume 4)
  - Forestry and Vegetation Environment (Volume 5)
  - Land and Resource Use (Volume 6)
  - Socio-Economic Environment (Volume 7)
  - Heritage Resources (Volume 8)

An Integrated Executive Summary covering the Environmental Impact Statements for both the Generation and Transmission Projects was included in each report, as was a Cree Translation of a PowerPoint presentation based on the Executive Summary.

*The proposed Wuskwatim Generating Station will be located at Taskinigup Falls (shown at right - looking downstream from the Falls) near the outlet of Wuskwatim Lake in the Nelson House Resource Management Area.*



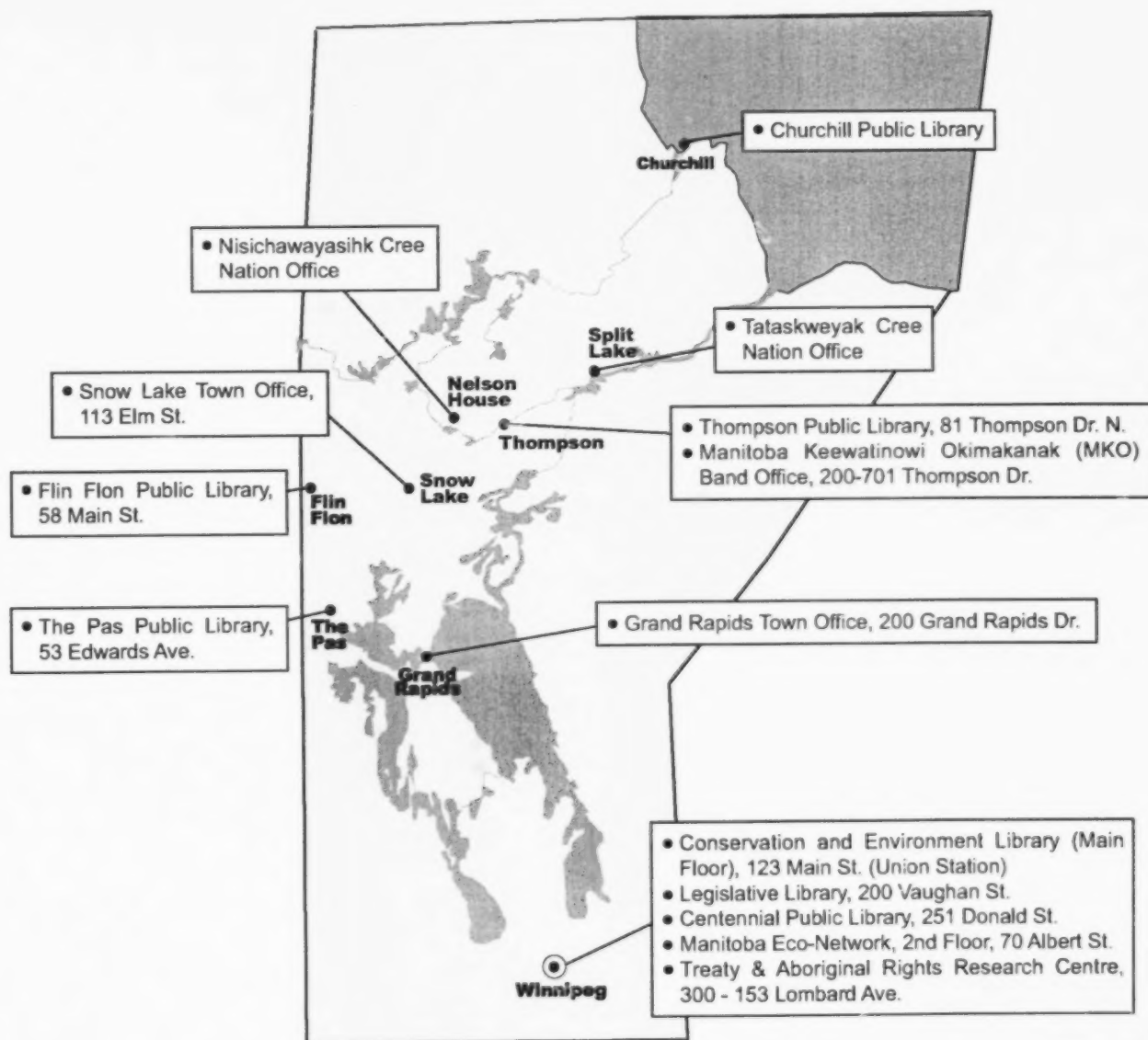


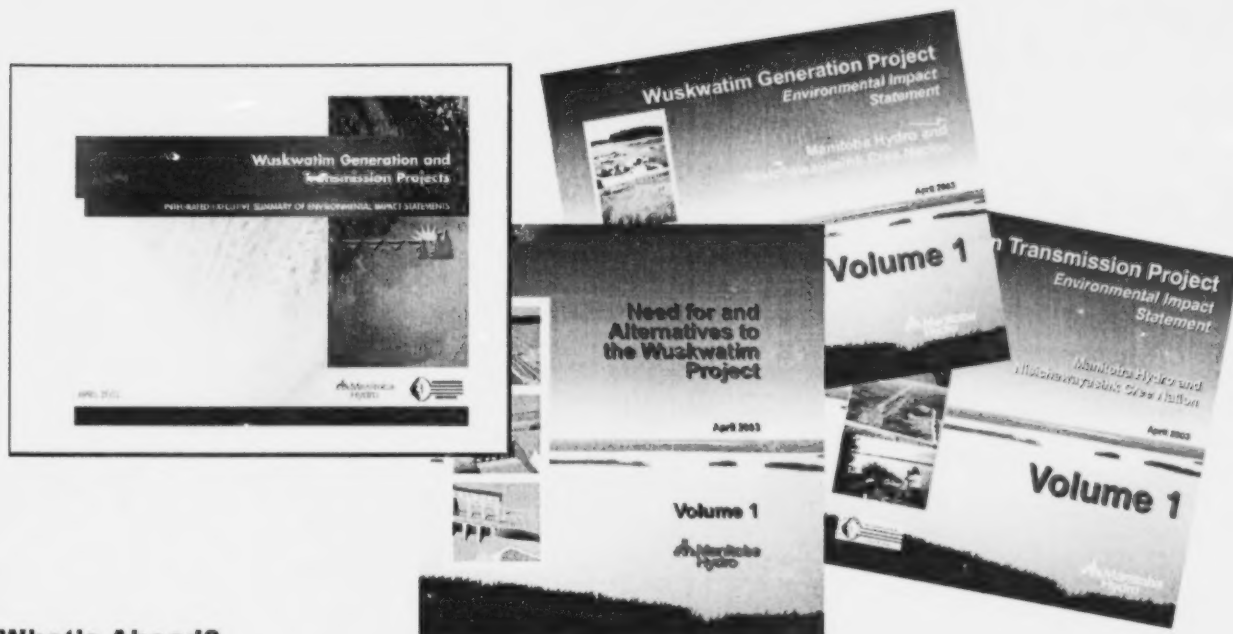
## Where Can These Reports be Seen?

All of these reports are available in Manitoba Conservation's Public Registries, as shown in the map below.

The main report for each of the three submissions can also be seen on Manitoba Hydro's Web site ([www.hydro.mb.ca/wuskwatim](http://www.hydro.mb.ca/wuskwatim)). The Integrated EIS Executive Summary and Cree Translation are also included there. A CD of all documents can be ordered through the web site.

*Location of Manitoba Conservation Public Registries where reports on the Wuskwatim Projects can be viewed*





## What's Ahead?

Next steps in the Wuskwatim Projects include:

- The Manitoba Government has placed the submissions on the public registry for an initial 60 day public review period. Anyone who wishes to provide comments on the EISs for the Wuskwatim Proposals, and/or the Need and Alternatives Submissions, should contact Manitoba Conservation in writing or by E-mail no later than June 30, 2003. Comments can be submitted in writing to Mr. Trent Hreno at Manitoba Conservation, Suite 160, 123 Main St., Winnipeg, Manitoba R3C 1A5 (tel: (204) 945-7080); or by email at [threno@gov.mb.ca](mailto:threno@gov.mb.ca).
- After consideration of all submissions, Manitoba Conservation will provide comments, questions and deficiencies to Manitoba Hydro and NCN. Shortly thereafter, Manitoba Hydro and NCN will file the necessary supplemental information requested by Manitoba Conservation.
- Following submission of supplementary information, Round Five of public consultation and involvement will focus on communicating the supplemental information to parties directly interested in the materials.
- The timing of the CEC public hearings will be determined in the next few months, probably to occur in the Fall of 2003. The terms of reference of this hearing have been provided to the CEC by the Minister (see CEC web site at [www.cecmanitoba.ca](http://www.cecmanitoba.ca)).
- Final licensing authorizations are anticipated near the end of 2003.



Further information about the Wuskwatim Projects can be found on Manitoba Hydro's Web site at:

[www.hydro.mb.ca/wuskwatim](http://www.hydro.mb.ca/wuskwatim)

## How to Contact Us

We invite your questions and comments about the Wuskwatim Projects or what's ahead in the Public Involvement Plan program. Please contact us:

Nick Barnes (Manitoba Hydro; Generation Project)  
(204) 474-3999 (phone) 474-4543 (fax)

Ron Rawluk (Manitoba Hydro; Transmission Project)  
(204) 474-3119 (phone) 474-4974 (fax)

Norman Linklater (NCN Future Development)  
(204) 484-3019 (phone) 484-2980 (fax)

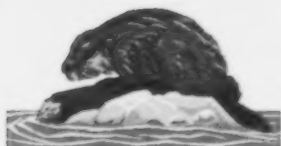
Marcel Moody (NCN Future Development)  
(204) 484-3018 (phone) 484-2980 (fax)

- 5 The Economic Outlook 2003 2004 attached. (see CCC/NFAAT/S/11 for comparison)

# Economic Outlook

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2003 - 2024



Economic Analysis  
Department  
Spring, 2003  
EO03-1

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## Preface

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The objective of this annual forecast is to provide a set of economic parameters for corporate use.

This information is used in several areas of the corporation; for example, in load forecasting, project evaluation, and financial planning.

The document is derived from a variety of sources, including forecasts from Global Insight, the Conference Board of Canada, Consensus Forecasts, Manitoba Bureau of Statistics, several financial and banking institutions such as Bank of Montreal, CIBC, Royal Bank, Scotiabank and TD Bank. As a final step prior to publication, the forecast is refined to reflect information available in early spring.

This forecast is based on what was known and could reasonably be foreseen at the time of its preparation. Users should be cognizant that conditions can and do change and should apply sensitivity analysis accordingly.

The variables are presented in both calendar year and fiscal year format. Fiscal year data have been derived from the calendar year data. Fiscal year data which conform with data found in C911 are presented on pages 1 to 4 following. The balance of the text relates to calendar year information.

## Executive Summary - Base Case

### Fiscal Year

| <b>MANITOBA</b>               | <b>02/03</b> | <b>03/04</b> | <b>04/05</b> | <b>05/06</b> | <b>06/07</b> | <b>07/08</b> | <b>08/09</b> | <b>09/10</b> |      |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| Real GDP (%)                  | 3.1          | 3.1          | 2.9          | 2.4          | 2.0          | 2.0          | 1.9          | 1.8          | "    |
| CPI (%)                       | 2.3          | 2.9          | 2.4          | 2.0          | 2.0          | 2.0          | 2.0          | 2.0          | & on |
| Population (000's)            | 1,152        | 1,155        | 1,159        | 1,162        | 1,165        | 1,169        | 1,172        | 1,175        | "    |
| Residential Customers (000's) | 338          | 340          | 343          | 344          | 346          | 348          | 350          | 352          | "    |
| Unemployment Rate (%)         | 5.1          | 5.0          | 5.0          | 5.0          | 5.0          | 4.9          | 4.9          | 4.9          | "    |

\*for 2010/11 and beyond, see page 3

| <b>CANADA</b>                 | <b>02/03</b> | <b>03/04</b> | <b>04/05</b> | <b>05/06</b> | <b>06/07</b> | <b>07/08</b> | <b>08/09</b> | <b>09/10</b> |      |
|-------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| Real GDP (%)                  | 3.3          | 3.2          | 3.2          | 3.0          | 3.0          | 3.0          | 3.0          | 3.0          | **   |
| CPI (%)                       | 3.0          | 3.3          | 2.4          | 2.0          | 2.0          | 2.0          | 2.0          | 2.0          | & on |
| 90 Day T-Bill (%)             | 2.79         | 3.75         | 4.50         | 4.50         | 4.50         | 4.50         | 4.50         | 4.50         | & on |
| GOC 10Yr+ Rate (%)            | 5.58         | 5.65         | 6.00         | 6.00         | 6.00         | 6.00         | 6.00         | 6.00         | & on |
| U.S. Exchange Rate (C\$/US\$) | 1.55         | 1.48         | 1.47         | 1.46         | 1.45         | 1.44         | 1.44         | 1.43         | **   |
| Unemployment Rate (%)         | 7.6          | 7.2          | 7.1          | 7.0          | 6.9          | 6.8          | 6.7          | 6.6          | **   |

\*\*for 2010/11 and beyond, see page 4

| <b>USA</b>              | <b>02/03</b> | <b>03/04</b> | <b>04/05</b> | <b>05/06</b> | <b>06/07</b> | <b>07/08</b> | <b>08/09</b> | <b>09/10</b> |      |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| Real GNP (%)            | 2.6          | 3.0          | 3.4          | 3.0          | 3.0          | 3.0          | 3.0          | 3.0          |      |
| CPI (%)                 | 2.0          | 2.3          | 2.3          | 2.5          | 2.5          | 2.5          | 2.5          | 2.5          | & on |
| GDP Deflator (%)        | 1.20         | 1.65         | 2.05         | 2.25         | 2.25         | 2.30         | 2.50         | 2.50         | & on |
| 90 Day T-Bill (%)       | 1.46         | 1.80         | 3.05         | 4.00         | 4.15         | 4.50         | 4.50         | 4.50         | & on |
| Long Term Bond Rate (%) | 4.29         | 4.90         | 5.40         | 5.75         | 5.75         | 5.75         | 5.75         | 5.75         | & on |
| Unemployment Rate (%)   | 5.0          | 5.6          | 5.4          | 5.2          | 5.2          | 5.0          | 5.0          | 5.0          | & on |

## Manitoba Hydro Key Variables

### Changes from Previous Forecast

|             | 2002      | 2003      |
|-------------|-----------|-----------|
| Fiscal Year | Base Case | Base Case |

#### RGDP (%)\*

|       |     |     |
|-------|-----|-----|
| 01/02 | 1.5 | 1.9 |
| 02/03 | 1.8 | 3.1 |
| 03/04 | 2.7 | 3.1 |
| 04/05 | 2.6 | 2.9 |
| 05/06 | 2.4 | 2.4 |
| 06/07 | 2.2 | 2.0 |
| 07/08 | 2.0 | 2.0 |
| 08/09 | 1.9 | 1.9 |
| 09/10 | 1.8 | 1.8 |

\*for 10/11 and beyond, see page 3

#### CPI - Inflation (%)

|            |      |     |
|------------|------|-----|
| 01/02      | 2.15 | 2.1 |
| 02/03      | 1.50 | 2.3 |
| 03/04      | 2.00 | 2.9 |
| 04/05      | 2.00 | 2.4 |
| 05/06      | 2.00 | 2.0 |
| 06/07      | 2.00 | 2.0 |
| 07/08      | 2.00 | 2.0 |
| 08/09      | 2.00 | 2.0 |
| 09/10 & on | 2.00 | 2.0 |

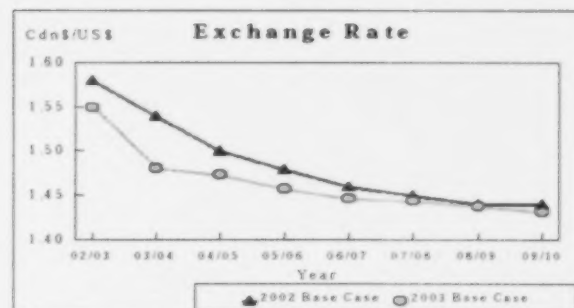
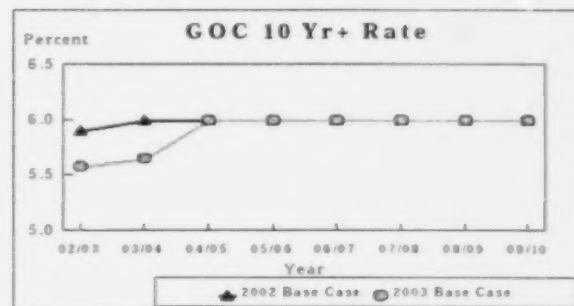
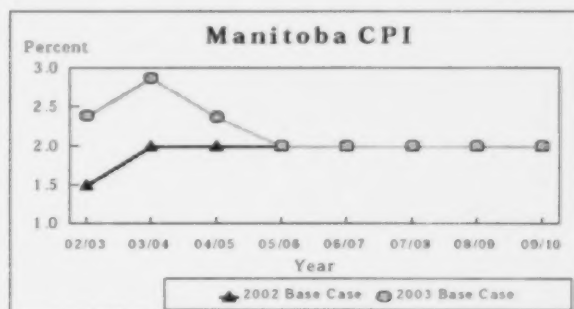
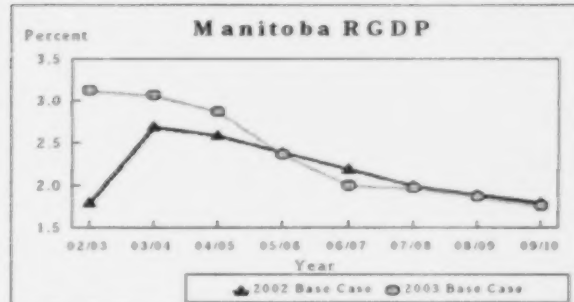
#### GOC 10 Yr+ Rate (%)

|            |      |      |
|------------|------|------|
| 01/02      | 5.81 | 5.81 |
| 02/03      | 5.75 | 5.58 |
| 03/04      | 5.90 | 5.65 |
| 04/05      | 6.00 | 6.00 |
| 05/06      | 6.00 | 6.00 |
| 06/07      | 6.00 | 6.00 |
| 07/08      | 6.00 | 6.00 |
| 08/09      | 6.00 | 6.00 |
| 09/10 & on | 6.00 | 6.00 |

#### Foreign Exchange (Cdn\$/U.S.\$)\*\*

|       |      |      |
|-------|------|------|
| 01/02 | 1.57 | 1.57 |
| 02/03 | 1.58 | 1.55 |
| 03/04 | 1.54 | 1.48 |
| 04/05 | 1.50 | 1.47 |
| 05/06 | 1.48 | 1.46 |
| 06/07 | 1.46 | 1.45 |
| 07/08 | 1.45 | 1.44 |
| 08/09 | 1.44 | 1.44 |
| 09/10 | 1.44 | 1.43 |

\*\*for 10/11 and beyond, see page 4





# Manitoba Economic Statistics

| Year            | Popu-<br>lation<br>'000 | Popu-<br>lation<br>% | Unempl.<br>Rate<br>% | Real<br>GDP<br>97\$m | Real<br>GDP<br>% | CPI<br>92=100 | CPI<br>% | M.H.<br>Res. Cus.<br>'000 |
|-----------------|-------------------------|----------------------|----------------------|----------------------|------------------|---------------|----------|---------------------------|
| 1978/79         | 1,040                   | 0.7                  | 6.3                  | 21,256               | 1.4              | 46.2          | 8.7      | 256                       |
| 1979/80         | 1,037                   | -0.3                 | 5.3                  | 21,256               | 0.0              | 50.5          | 9.4      | 263                       |
| 1980/81         | 1,035                   | -0.2                 | 5.5                  | 21,776               | 2.4              | 55.6          | 10.1     | 262                       |
| 1981/82         | 1,039                   | 0.4                  | 6.6                  | 22,729               | 4.4              | 61.6          | 10.8     | 265                       |
| 1982/83         | 1,050                   | 1.1                  | 8.6                  | 22,703               | -0.1             | 66.7          | 8.3      | 266                       |
| 1983/84         | 1,064                   | 1.3                  | 9.4                  | 23,349               | 2.8              | 70.8          | 6.0      | 271                       |
| 1984/85         | 1,074                   | 1.0                  | 8.7                  | 24,748               | 6.0              | 73.1          | 3.3      | 277                       |
| 1985/86         | 1,085                   | 0.9                  | 8.2                  | 25,455               | 2.9              | 76.4          | 4.5      | 281                       |
| 1986/87         | 1,093                   | 0.8                  | 7.6                  | 26,304               | 3.3              | 79.7          | 4.3      | 288                       |
| 1987/88         | 1,099                   | 0.5                  | 7.4                  | 26,547               | 0.9              | 83.0          | 4.2      | 295                       |
| 1988/89         | 1,102                   | 0.3                  | 7.5                  | 26,734               | 0.7              | 86.6          | 4.4      | 300                       |
| 1989/90         | 1,104                   | 0.1                  | 7.3                  | 27,368               | 2.4              | 90.7          | 4.7      | 304                       |
| 1990/91         | 1,107                   | 0.2                  | 7.6                  | 27,576               | 0.8              | 95.2          | 4.9      | 307                       |
| 1991/92         | 1,110                   | 0.3                  | 8.8                  | 26,629               | -3.4             | 98.8          | 3.8      | 309                       |
| 1992/93         | 1,114                   | 0.4                  | 9.4                  | 26,710               | 0.3              | 100.7         | 1.8      | 311                       |
| 1993/94         | 1,120                   | 0.5                  | 9.3                  | 27,126               | 1.6              | 103.1         | 2.4      | 314                       |
| 1994/95         | 1,125                   | 0.5                  | 8.1                  | 27,909               | 2.9              | 104.7         | 1.6      | 317                       |
| 1995/96         | 1,131                   | 0.5                  | 7.2                  | 28,289               | 1.4              | 107.3         | 2.5      | 320                       |
| 1996/97         | 1,135                   | 0.4                  | 6.9                  | 29,094               | 2.8              | 110.0         | 2.5      | 322                       |
| 1997/98         | 1,137                   | 0.2                  | 6.2                  | 30,071               | 3.4              | 111.8         | 1.6      | 325                       |
| 1998/99         | 1,139                   | 0.2                  | 5.5                  | 31,155               | 3.6              | 113.4         | 1.4      | 328                       |
| 1999/00         | 1,144                   | 0.4                  | 5.4                  | 31,774               | 2.0              | 116.0         | 2.3      | 331                       |
| 2000/01         | 1,147                   | 0.3                  | 4.8                  | 32,465               | 2.2              | 118.9         | 2.5      | 333                       |
| 2001/02         | 1,150                   | 0.3                  | 5.0                  | 33,095               | 1.9              | 121.4         | 2.1      | 335                       |
| 2002/03         | 1,152                   | 0.2                  | 5.1                  | 34,127               | 3.1              | 124.2         | 2.3      | 338                       |
| <b>Forecast</b> |                         |                      |                      |                      |                  |               |          |                           |
| 2003/04         | 1,155                   | 0.3                  | 5.0                  | 35,177               | 3.1              | 127.8         | 2.9      | 340                       |
| 2004/05         | 1,159                   | 0.3                  | 5.0                  | 36,187               | 2.9              | 130.8         | 2.4      | 343                       |
| 2005/06         | 1,162                   | 0.3                  | 5.0                  | 37,046               | 2.4              | 133.4         | 2.0      | 344                       |
| 2006/07         | 1,165                   | 0.3                  | 5.0                  | 37,787               | 2.0              | 136.1         | 2.0      | 346                       |
| 2007/08         | 1,169                   | 0.3                  | 4.9                  | 38,533               | 2.0              | 138.8         | 2.0      | 348                       |
| 2008/09         | 1,172                   | 0.3                  | 4.9                  | 39,252               | 1.9              | 141.6         | 2.0      | 350                       |
| 2009/10         | 1,175                   | 0.3                  | 4.9                  | 39,943               | 1.8              | 144.4         | 2.0      | 352                       |
| 2010/11         | 1,178                   | 0.3                  | 4.9                  | 40,648               | 1.8              | 147.3         | 2.0      | 354                       |
| 2011/12         | 1,181                   | 0.3                  | 4.9                  | 41,336               | 1.7              | 150.3         | 2.0      | 356                       |
| 2012/13         | 1,184                   | 0.3                  | 4.8                  | 41,989               | 1.6              | 153.3         | 2.0      | 358                       |
| 2013/14         | 1,187                   | 0.3                  | 4.7                  | 42,672               | 1.6              | 156.3         | 2.0      | 360                       |
| 2014/15         | 1,190                   | 0.2                  | 4.6                  | 43,356               | 1.6              | 159.5         | 2.0      | 361                       |
| 2015/16         | 1,193                   | 0.2                  | 4.5                  | 44,041               | 1.6              | 162.6         | 2.0      | 363                       |
| 2016/17         | 1,196                   | 0.2                  | 4.5                  | 44,728               | 1.6              | 165.9         | 2.0      | 365                       |
| 2017/18         | 1,198                   | 0.2                  | 4.4                  | 45,416               | 1.5              | 169.2         | 2.0      | 367                       |
| 2018/19         | 1,201                   | 0.2                  | 4.3                  | 46,107               | 1.5              | 172.6         | 2.0      | 369                       |
| 2019/20         | 1,203                   | 0.2                  | 4.2                  | 46,799               | 1.5              | 176.0         | 2.0      | 371                       |
| 2020/21         | 1,206                   | 0.2                  | 4.1                  | 47,495               | 1.5              | 179.6         | 2.0      | 372                       |
| 2021/22         | 1,208                   | 0.2                  | 4.0                  | 48,192               | 1.5              | 183.2         | 2.0      | 374                       |
| 2022/23         | 1,210                   | 0.2                  | 3.9                  | 48,893               | 1.5              | 186.8         | 2.0      | 376                       |
| 2023/24         | 1,212                   | 0.2                  | 3.8                  | 49,595               | 1.4              | 190.6         | 2.0      | 377                       |

# Canada Economic Statistics

| Year     | Real GDP<br>97\$b | Real GDP<br>% | CPI<br>92=100 | CPI<br>% | 90 Day<br>TBill<br>Rate<br>% | GOC<br>10 Yr+<br>Rate<br>% | Unempl.<br>Rate<br>% | Cdn\$/<br>US\$ |
|----------|-------------------|---------------|---------------|----------|------------------------------|----------------------------|----------------------|----------------|
| 1978/79  | 560               | 4.1           | 44.6          | 9.0      | 9.54                         | 9.46                       | 8.2                  | 1.15           |
| 1979/80  | 579               | 3.5           | 48.8          | 9.3      | 12.50                        | 10.95                      | 7.5                  | 1.17           |
| 1980/81  | 589               | 1.7           | 54.0          | 10.6     | 13.45                        | 12.59                      | 7.5                  | 1.18           |
| 1981/82  | 596               | 1.2           | 60.6          | 12.2     | 17.21                        | 15.73                      | 8.5                  | 1.20           |
| 1982/83  | 587               | -1.5          | 66.5          | 9.8      | 12.32                        | 13.40                      | 11.2                 | 1.24           |
| 1983/84  | 608               | 3.5           | 70.0          | 5.2      | 9.49                         | 11.92                      | 11.8                 | 1.24           |
| 1984/85  | 641               | 5.5           | 72.8          | 4.0      | 11.15                        | 12.60                      | 11.1                 | 1.32           |
| 1985/86  | 668               | 4.2           | 75.8          | 4.1      | 9.52                         | 10.58                      | 10.3                 | 1.38           |
| 1986/87  | 687               | 2.9           | 78.9          | 4.1      | 8.06                         | 9.27                       | 9.4                  | 1.37           |
| 1987/88  | 718               | 4.4           | 82.3          | 4.4      | 8.47                         | 10.15                      | 8.6                  | 1.31           |
| 1988/89  | 749               | 4.4           | 85.7          | 4.1      | 10.26                        | 10.37                      | 7.7                  | 1.21           |
| 1989/90  | 764               | 2.0           | 90.2          | 5.2      | 12.33                        | 9.95                       | 7.7                  | 1.18           |
| 1990/91  | 761               | -0.4          | 94.8          | 5.0      | 12.07                        | 10.72                      | 8.7                  | 1.16           |
| 1991/92  | 751               | -1.4          | 98.9          | 4.4      | 8.02                         | 9.53                       | 10.6                 | 1.15           |
| 1992/93  | 760               | 1.2           | 100.5         | 1.6      | 6.09                         | 8.59                       | 11.3                 | 1.23           |
| 1993/94  | 783               | 3.0           | 102.0         | 1.5      | 4.46                         | 7.62                       | 11.0                 | 1.31           |
| 1994/95  | 816               | 4.3           | 102.4         | 0.4      | 6.46                         | 9.01                       | 10.2                 | 1.38           |
| 1995/96  | 837               | 2.5           | 104.6         | 2.1      | 6.17                         | 7.95                       | 9.6                  | 1.36           |
| 1996/97  | 856               | 2.3           | 106.4         | 1.7      | 3.68                         | 7.31                       | 9.6                  | 1.36           |
| 1997/98  | 892               | 4.2           | 107.8         | 1.4      | 3.62                         | 6.09                       | 9.0                  | 1.40           |
| 1998/99  | 931               | 4.4           | 108.9         | 0.9      | 4.81                         | 5.37                       | 8.1                  | 1.50           |
| 1999/00  | 979               | 5.2           | 111.2         | 2.2      | 4.82                         | 5.91                       | 7.4                  | 1.47           |
| 2000/01  | 1,016             | 3.7           | 114.3         | 2.8      | 5.42                         | 5.78                       | 6.9                  | 1.50           |
| 2001/02  | 1,036             | 2.0           | 116.9         | 2.2      | 3.10                         | 5.81                       | 7.3                  | 1.57           |
| 2002/03  | 1,071             | 3.3           | 120.3         | 3.0      | 2.79                         | 5.58                       | 7.6                  | 1.55           |
| Forecast |                   |               |               |          |                              |                            |                      |                |
| 2003/04  | 1,104             | 3.2           | 124.2         | 3.3      | 3.75                         | 5.65                       | 7.2                  | 1.48           |
| 2004/05  | 1,140             | 3.2           | 127.2         | 2.4      | 4.50                         | 6.00                       | 7.1                  | 1.47           |
| 2005/06  | 1,174             | 3.0           | 129.7         | 2.0      | 4.50                         | 6.00                       | 7.0                  | 1.46           |
| 2006/07  | 1,209             | 3.0           | 132.3         | 2.0      | 4.50                         | 6.00                       | 6.9                  | 1.45           |
| 2007/08  | 1,246             | 3.0           | 135.0         | 2.0      | 4.50                         | 6.00                       | 6.8                  | 1.44           |
| 2008/09  | 1,283             | 3.0           | 137.7         | 2.0      | 4.50                         | 6.00                       | 6.7                  | 1.44           |
| 2009/10  | 1,322             | 3.0           | 140.4         | 2.0      | 4.50                         | 6.00                       | 6.6                  | 1.43           |
| 2010/11  | 1,360             | 2.9           | 143.2         | 2.0      | 4.50                         | 6.00                       | 6.5                  | 1.43           |
| 2011/12  | 1,398             | 2.7           | 146.1         | 2.0      | 4.50                         | 6.00                       | 6.4                  | 1.42           |
| 2012/13  | 1,435             | 2.7           | 149.0         | 2.0      | 4.50                         | 6.00                       | 6.2                  | 1.41           |
| 2013/14  | 1,471             | 2.5           | 152.0         | 2.0      | 4.50                         | 6.00                       | 6.1                  | 1.40           |
| 2014/15  | 1,508             | 2.5           | 155.0         | 2.0      | 4.50                         | 6.00                       | 6.0                  | 1.40           |
| 2015/16  | 1,546             | 2.5           | 158.2         | 2.0      | 4.50                         | 6.00                       | 5.9                  | 1.39           |
| 2016/17  | 1,584             | 2.5           | 161.3         | 2.0      | 4.50                         | 6.00                       | 5.8                  | 1.38           |
| 2017/18  | 1,623             | 2.4           | 164.5         | 2.0      | 4.50                         | 6.00                       | 5.7                  | 1.38           |
| 2018/19  | 1,659             | 2.3           | 167.8         | 2.0      | 4.50                         | 6.00                       | 5.6                  | 1.37           |
| 2019/20  | 1,697             | 2.3           | 171.2         | 2.0      | 4.50                         | 6.00                       | 5.5                  | 1.36           |
| 2020/21  | 1,735             | 2.3           | 174.6         | 2.0      | 4.50                         | 6.00                       | 5.4                  | 1.36           |
| 2021/22  | 1,774             | 2.3           | 178.1         | 2.0      | 4.50                         | 6.00                       | 5.3                  | 1.35           |
| 2022/23  | 1,814             | 2.3           | 181.7         | 2.0      | 4.50                         | 6.00                       | 5.1                  | 1.34           |
| 2023/24  | 1,855             | 2.2           | 185.3         | 2.0      | 4.50                         | 6.00                       | 5.0                  | 1.34           |

## Executive Summary - Base Case

### Calendar Year

| MANITOBA                      | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |      |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Real GDP (%)                  | 3.1   | 3.1   | 3.0   | 2.5   | 2.0   | 2.0   | 1.9   | 1.8   | *    |
| CPI (%)                       | 1.6   | 3.0   | 2.5   | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   | & on |
| Population (000's)            | 1,151 | 1,154 | 1,158 | 1,161 | 1,165 | 1,168 | 1,171 | 1,174 | *    |
| Residential Customers (000's) | 336   | 339   | 341   | 343   | 345   | 347   | 349   | 350   | *    |
| Unemployment Rate (%)         | 5.2   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 4.9   | 4.9   | *    |

\*for 2010 and on, see page 21

| CANADA                        | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |      |
|-------------------------------|------|------|------|------|------|------|------|------|------|
| Real GDP (%)                  | 3.4  | 3.1  | 3.3  | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | **   |
| CPI (%)                       | 2.2  | 3.5  | 2.5  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | & on |
| 90 Day TBill (%)              | 2.59 | 3.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | & on |
| GOC 10 Yr+ Rate (%)           | 5.66 | 5.50 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | & on |
| U.S. Exchange Rate (C\$/US\$) | 1.57 | 1.48 | 1.48 | 1.46 | 1.45 | 1.44 | 1.44 | 1.43 | **   |
| Unemployment Rate (%)         | 7.7  | 7.2  | 7.1  | 7.0  | 6.9  | 6.8  | 6.7  | 6.6  | **   |

\*\*for 2010 and on, see page 22

| USA                     | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |      |
|-------------------------|------|------|------|------|------|------|------|------|------|
| Real GNP (%)            | 2.4  | 2.8  | 3.5  | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | & on |
| CPI (%)                 | 1.6  | 2.3  | 2.3  | 2.5  | 2.5  | 2.5  | 2.5  | 2.5  | & on |
| GDP Deflator (%)        | 1.14 | 1.50 | 2.00 | 2.25 | 2.25 | 2.25 | 2.50 | 2.50 | & on |
| 90 Day TBill (%)        | 1.60 | 1.50 | 2.75 | 4.00 | 4.00 | 4.50 | 4.50 | 4.50 | & on |
| Long Term Bond Rate (%) | 4.61 | 4.75 | 5.25 | 5.75 | 5.75 | 5.75 | 5.75 | 5.75 | & on |
| Unemployment Rate (%)   | 5.8  | 5.7  | 5.4  | 5.2  | 5.2  | 5.0  | 5.0  | 5.0  | & on |

## Manitoba Hydro Key Variables

### Changes from Previous Forecast

| Calendar Year | 2002 Base Case | 2003 Base Case |
|---------------|----------------|----------------|
| 2002          | 1.5            | 3.1            |
| 2003          | 2.7            | 3.1            |
| 2004          | 2.7            | 3.0            |
| 2005          | 2.5            | 2.5            |
| 2006          | 2.3            | 2.0            |
| 2007          | 2.0            | 2.0            |
| 2008          | 1.9            | 1.9            |
| 2009          | 1.8            | 1.8            |

\*for 2010 and beyond, see page 21

### CPI - Inflation (%)

|      |      |     |
|------|------|-----|
| 2002 | 1.50 | 1.6 |
| 2003 | 2.00 | 3.0 |
| 2004 | 2.00 | 2.5 |
| 2005 | 2.00 | 2.0 |
| 2006 | 2.00 | 2.0 |
| 2007 | 2.00 | 2.0 |
| 2008 | 2.00 | 2.0 |
| 2009 | 2.00 | 2.0 |

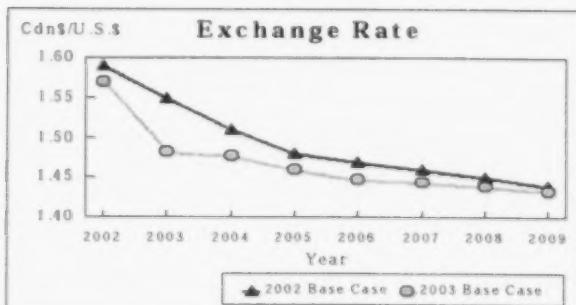
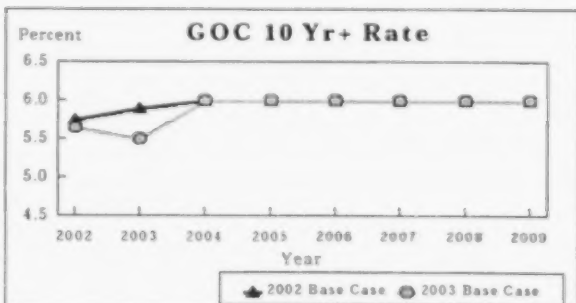
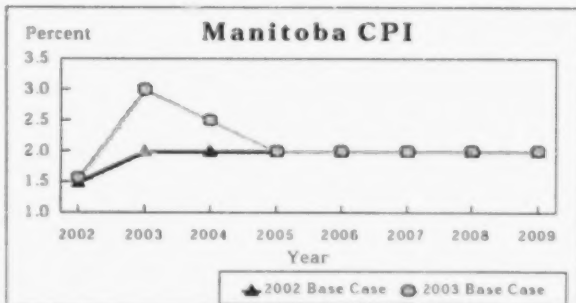
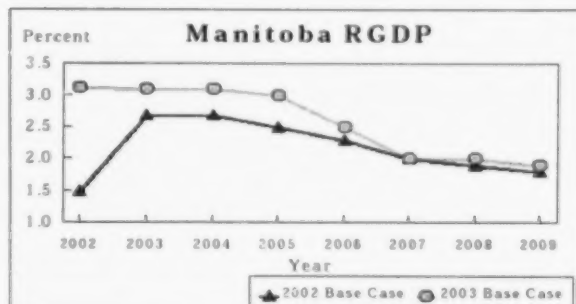
### GOC 10yr+ Rate (%)

|      |      |      |
|------|------|------|
| 2002 | 5.75 | 5.66 |
| 2003 | 5.90 | 5.50 |
| 2004 | 6.00 | 6.00 |
| 2005 | 6.00 | 6.00 |
| 2006 | 6.00 | 6.00 |
| 2007 | 6.00 | 6.00 |
| 2008 | 6.00 | 6.00 |
| 2009 | 6.00 | 6.00 |

### Foreign Exchange (Cdn\$/U.S.\$)\*\*

|      |      |      |
|------|------|------|
| 2002 | 1.59 | 1.57 |
| 2003 | 1.55 | 1.48 |
| 2004 | 1.51 | 1.48 |
| 2005 | 1.48 | 1.46 |
| 2006 | 1.47 | 1.45 |
| 2007 | 1.46 | 1.44 |
| 2008 | 1.45 | 1.44 |
| 2009 | 1.44 | 1.43 |

\*\*for 2010 and beyond, see page 22



## Highlights

### Executive Summary

The Manitoba economy grew by 3.1% in 2002, and is expected to grow by 3.1% in 2003 and 3.0% in 2004. In the long term, the economy is expected to grow at similar rates to last year's forecast. Long term forecasts are based on annual productivity growth and anticipated employment growth. The economy is expected to grow: 2.5% by the year 2005, 1.8% by 2010, 1.6% by 2015, and 1.4% by 2024.

Consumer expenditures, particularly in durable goods, and government purchase of goods and services were the driving force behind Canada's real growth of 3.4% in 2002. Exports of goods and services increased only 0.8% as a result of a weakening U.S. economy while imports were also up 0.8%. The long term real growth for the Canadian economy is forecast to be 2.4%, down slightly from last year's forecast.

The Bank of Canada continues to target inflation at approximately 2.0% plus or minus 1.0%. In the medium to long term, price stability is expected to be maintained. The 2003 Economic Outlook forecasts a 2.00% long term inflation rate similar to the past four outlooks.

Manitoba Hydro's cost of new debt is calculated from the expected long-term Canadian government bond rate plus the provincial guarantee fee of 0.95% as well as an adjustment to reflect the difference in borrowing costs for Manitoba. The 2003 Economic Outlook forecasts GOC 10 year+ rate at 6.00%. The real interest rate will be 3.92%, similar to last year's forecast.

In the near term, the Canadian dollar is expected to improve from current levels of \$1.5703 US to \$1.51 US in 2003. In 2010, the exchange rate is forecast to be at the \$1.43 US level based on lower Canadian inflation rates relative to the United States and \$1.33 US by 2024. A lower Canadian inflation rate relative to the United States is the principal cause behind the Canadian dollar's relative improved performance in the long term.

The Canadian unemployment rate is expected to trend towards 7.0% by the year 2005 and 5.0% in 2020 as a result of a slightly higher growth rate in employment compared to the growth rate in the labour force.

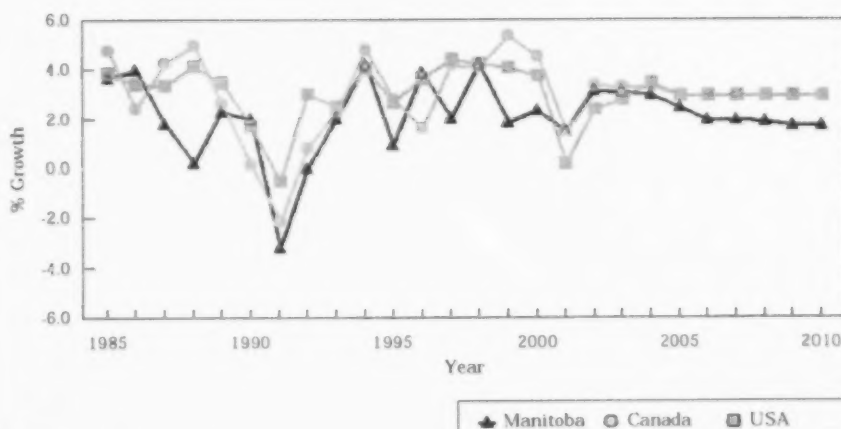
### Uncertainties

What impact will the pending war have on the economy in general and on the price of oil in particular?

What will the cost of the Kyoto accord, ratified by Canada, be on the Canadian economy?

How will the U.S. fiscal and trade deficits impact the economic recovery?

**Manitoba, Canada & U.S. Real GDP**





## **2002 in Review**

### **Manitoba and Canada**

Consumption of goods and services and business and government investments helped sustain the Manitoba economy to grow at 3.1% real in 2002.

As a result of weak exports to the United States, manufacturing shipments in Manitoba increased moderately by 0.6% in 2002 over 2001 levels. Canada's shipments increased by 1.9% over the same period. Increases in Manitoba shipments were experienced in agricultural products and the energy sector as well as manufacturing products compared to 2001.

The Manitoba population grew at an annual rate of 0.15% in 2002, down from a revised growth of 0.23% in 2001.

Manitoba housing starts were up 22.1% to 3,617 units in 2002 from 2,963 units in 2001. Single housing units were up 22.6% to 3,016 while multiple units were up 19.5% to 601 for the same period.

Manitoba's retail sales registered a 6.9% increase in 2002, in line with strong growth in consumption. Canada's retail sector enjoyed another good year posting a 6.0% increase over 2001 levels.

Manitoba farm cash receipts increased by 2.9% in 2002 over 2001 levels. Total crop cash receipts increased by 24.4%, while livestock cash receipts decreased by 5.2% and direct payments decreased from \$382 million in 2001 to \$219 million in 2002.

The value of mineral production was \$0.982 billion in 2002 which represents a decrease of 4.4% over the 2001 value of production of \$1.023 billion.

The Canadian economy grew at an annual rate of 3.4% in 2002. Consumer expenditures of goods and services grew 2.9% while government expenditures were up 2.8%. Business investments decreased by 3.8% while residential investment was up 16.0% as a result of the strong demand for new housing units. Exports and imports were up 0.8% over last year's level.

The bank rate was raised three times by the Bank of Canada in 2002. In early January, it stood at 2.25% but at year end it stood at 3.00%.

The short term Canadian-US interest rate differential stood at 0.98% while the long term Canadian-US interest rate differential was 1.06%. The short-term real interest rate decreased from 1.24% in 2001 to 0.34% in 2002. The long-term real interest increased slightly in 2002 from 3.24% in 2001 to 3.41%.

On an annual basis, the Canadian dollar depreciated from \$1.5489 US in 2001 to \$1.5703 US in 2002. The Canadian dollar started the year at \$1.6003 US and appreciated steadily and finished the year at \$1.5593 US as a result of Canada's superior economic fundamentals and wider interest-rate spreads vis-à-vis the United States' rates.

### **United States**

In 2002, the United States' economy grew at an annual rate of 2.4% boosted by strong consumer demand and business investments. Retail sales advanced by 2.1% in 2002 over 2001 levels.

The United States' CPI, commonly used to measure overall price inflation, increased by 1.6% in 2002 compared to 2.8% in 2001.

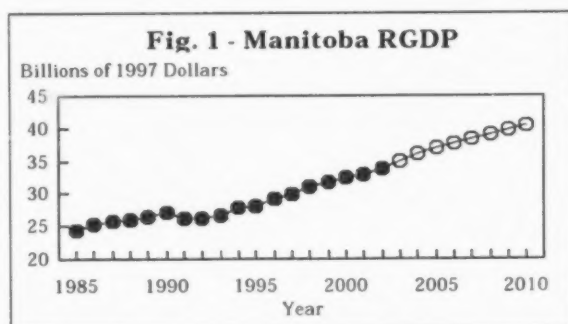
U.S. short-term interest rates held steady throughout most of 2002 and were dropped in November as a result of continued weakness in the United States' economy. The international trade deficit in goods and services increased from \$427.2 billion in 2001 to \$484.4 billion in 2002.

## Manitoba

### Real Gross Domestic Product

The Manitoba economy registered a higher than expected real increase of 3.1% in 2002, compared to the 3.4% growth posted by the national economy. The key forces driving the provincial economy in 2002 were consumer expenditures, government investments, and business investments. Those sectors posted increases of 3.4%, 3.6%, and 2.0% respectively.

The downfall of the North American stock market, terrorist attacks, and corporate accounting scandals have not dampened consumer and business confidence in Manitoba. Sales of automobiles, furniture and appliances, and other interest items such as housing starts and resale of existing houses grew at double-digit rates.



A sharp increase in residential repair and renovation and housing starts boosted residential investment spending by 13.3%. Infrastructure spending on health, social services, and education institutions pushed non-residential construction spending by 2.8%. Government investment in capital increased by 3.6% in 2002.

Total exports of goods and services decreased by 0.3% in 2002 after increasing by 3.8% in 2001. Corresponding to the surge in consumer expenditures, total imports of goods and services increased by 1.2% in 2002, compared to a small drop of 0.3% in 2001.

Although most base and precious metal prices were improving throughout 2002, the value of mineral production increased marginally from \$1.047 billion in 2001 to \$1.050 billion in 2002 as a result of weak world economic growth. The price of silver increased from \$4.40 US/oz in 2001 to \$4.63 US/oz in 2002, while gold increased from \$271.02 US/oz to \$309.79 US/oz over the same period. Nickel prices increased by 13.2% in 2002 and copper prices fell 1.1%. Zinc prices were down 12.2% in 2002 from 2001 price levels.

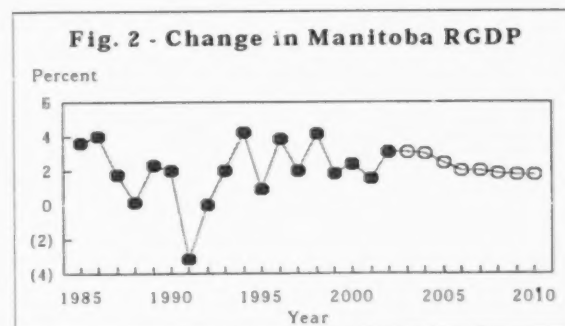
Total farm cash receipts increased by 2.9% from \$3.648 billion in 2001 to \$3.755 billion in 2002. After several years of weak prices all cereal and oilseeds grain prices rebounded in 2002. Livestock receipts were down 5.2% while direct payments decreased from \$382 million in 2001 to \$219 million in 2002. Cash crop receipts were up 24.4% in 2002 over 2001 levels. Canola and flaxseed prices were up 20.2% and 26.2% respectively while wheat prices experienced an increase of 16.0% after experiencing four years of successive drops in the past five years. Wheat prices were \$175.95 per US tonne in 2002 compared to \$151.64 per US tonne in 2001 — an increase of 16.0%.

Retail sales posted a 6.9% growth in 2002 from \$9.9 billion in 2001 to \$10.6 billion in 2002.

**Table I - Manitoba Real GDP**

| Year      | Average 5 Year Growth Rate (%) |
|-----------|--------------------------------|
| 1965-1970 | 3.9                            |
| 1970-1975 | 2.8                            |
| 1975-1980 | 3.0                            |
| 1980-1985 | 3.3                            |
| 1985-1990 | 2.1                            |
| 1990-2000 | 1.5                            |
| 2000-2005 | 2.7                            |
| 2005-2009 | 1.9                            |
| 2009-2024 | 1.6                            |

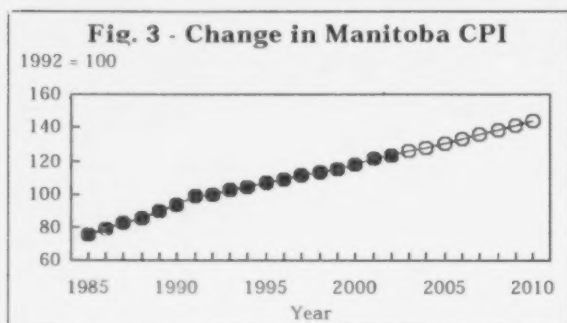
In the short term, the Manitoba economy is expected to gain by 3.1% in 2003, and trend at a 2.2% real annual growth rate during the 2004-2009 period. In the long term, the factors of production are on a downward trend relative to the past: employment is expected to grow at a slower rate than experienced in the past (0.5%) and output per employee is expected to grow at approximately 1.1%. Consequently, the economy is forecast to grow at an annual rate of 1.6% similar to the 2002 Economic Outlook.



## Manitoba

### Consumer Price Index

Manitoba's 2002 rate of inflation, measured by the rate of change in the Consumer Price Index, increased at an annual average rate of 1.6%. The increase is below last year's increase of 2.6% and lower than Canada's 2002 rate of inflation of 2.2%.



Besides a huge increase in Alcohol, Beverage and Tobacco (15.7%), other sub-components of the CPI index experienced modest increases such as food (2.4%), household operations (2.6%), and health and personal care (1.7%). Transportation and recreation and reading increased at 1.0% and 0.9% respectively, while shelter dropped 0.5% and clothing and footwear fell 0.9%.

The inflation rate "all items less food and energy" increased at an annual rate of 2.0% in 2002 versus 1.8% in 2001. The energy price index decreased by 3.7% in 2002, as a result of a drop in all sub-components led by a natural gas price decrease of 10.3% and a fuel oil price decrease of 8.3%. The electricity price index decreased, although modestly, by 0.3%.

The overall composite Prairie Construction Index increased by 2.5% in 2002 over 2001 levels. The material component (cement and lumber) increased by 2.1% while the labour component increased by 3.0%.

**Table III - Manitoba CPI by Component vs. Canada CPI by Component - 2002 over 2001**

|                                      | Manitoba<br>CPI<br>% change | Canada<br>CPI<br>% change |
|--------------------------------------|-----------------------------|---------------------------|
| All Items                            | 1.6                         | 2.2                       |
| Food                                 | 2.4                         | 2.6                       |
| Shelter                              | -0.5                        | 0.9                       |
| Household Operations                 | 2.6                         | 1.4                       |
| Clothing & Footwear                  | -0.9                        | -0.8                      |
| Transportation                       | 1.0                         | 2.8                       |
| Health & Personal Care               | 1.7                         | 1.1                       |
| Recreation, Education<br>& Reading   | 0.9                         | 1.6                       |
| Alcohol, Beverage,<br>& Tobacco      | 15.7                        | 17.6                      |
| Goods                                | 1.2                         | 1.7                       |
| Services                             | 1.9                         | 2.9                       |
| All Items excluding<br>Food & Energy | 2.0                         | 2.7                       |
| Energy                               | -3.7                        | -2.0                      |

Manitoba's low unemployment rate, combined with strong employment growth in 2002, has had a minimal impact on wages. In fact, the aggregate industrial wage rate increased by 2.0% from \$591.4 in 2001 to \$603.1 in 2002.

In the near to medium term, the inflation rate is expected to be 3.0% in 2003 and 2.5% in 2004.

In the long term, a 2.0% rate of inflation is projected, similar to the 2002 Economic Outlook.

**Table II - Manitoba CPI**

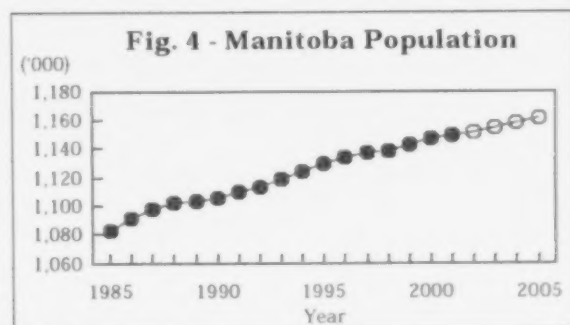
| Year      | Man. CPI<br>All Items<br>(%) | Food<br>(%) | Household<br>Operation<br>(%) | Transportation<br>(%) | Clothing<br>(%) |
|-----------|------------------------------|-------------|-------------------------------|-----------------------|-----------------|
| 1980-1985 | 6.9                          | 4.7         | 5.8                           | 8.4                   | 4.3             |
| 1985-1990 | 4.4                          | 4.3         | 3.9                           | 4.2                   | 3.9             |
| 1990-1995 | 1.2                          | 1.2         | 0.6                           | 1.4                   | 1.4             |
| 1995-2002 | 2.0                          | 2.2         | 2.4                           | 2.3                   | 1.2             |
| 2002-2007 | 2.3                          |             |                               |                       |                 |
| 2007-2024 | 2.0                          |             |                               |                       |                 |



## Manitoba

### Population

Manitoba's population increased by 1,726 in 2002 or 0.15% over 2001 levels — the second lowest increase in the past ten years. In 2001, the revised population increase was 2,674 people while there were revised increases of 3,899 people in 2000.



There were 13,940 births in 2002 — a new recorded low level for the last three decades, while deaths were up to 10,346. Consequently, there was a natural increase of 3,594 people — the lowest level in 40 years.

**Table IV - Manitoba Population**

| Year      | 5 Year Average Growth (%) |
|-----------|---------------------------|
| 1960-1965 | 1.2                       |
| 1965-1970 | 0.4                       |
| 1970-1975 | 0.8                       |
| 1975-1980 | 0.2                       |
| 1980-1985 | 0.9                       |
| 1985-1990 | 0.4                       |
| 1990-1995 | 0.4                       |
| 1995-2000 | 0.3                       |
| 2000-2005 | 0.3                       |
| 2005-2024 | 0.2                       |

A declining population growth rate as well as an aging population have attracted the attention of policy-makers in recent years. They believe that increased numbers in international migrants is a possible solution to the aging population, to the anticipated labour shortage, and to sustained economic growth in the future.

In 2002, the hopes of a boost from a positive net in-migration were dashed as net international in-migration was 3,085 while net interprovincial out-migration was 5,298, a net loss of 2,213.

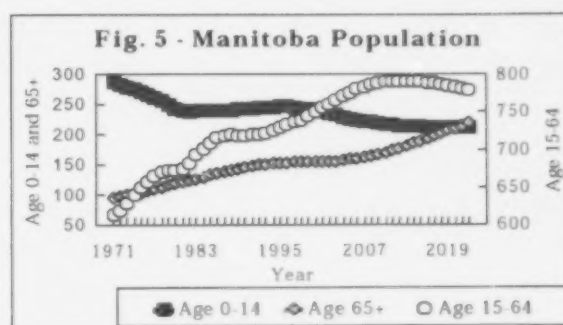
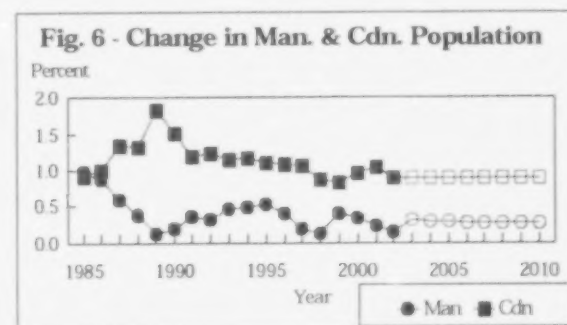


Figure 5 provides a picture of the Manitoba population age cohorts. The age cohort 0-14 falls at an annual rate of 0.45% from 232,498 in 2003 to 211,583 in 2024. The 15-64 age cohort grows at an annual rate of 0.06% from 765,695 in 2003 to 775,497 people in 2024. By the year 2012, the first baby boomers will be 65 years old. The 65+ age cohort grows steadily at an annual rate of 1.77% to 225,771 in 2024. It has been observed that the 25-34 age cohort has declined from 184,869 in 1992 to 155,790 in 2002 — a drop of 29,079 people. This drop may explain the low levels of new housing units throughout the last ten years.

The 2003 population forecast is based on a fertility rate of 1.77 per female of child-bearing age, down from 1.82 in last year's economic outlook, a net interprovincial out-migration of 2,000, as well as an annual increase of international in-migration of 1% starting at 4,040 in 2003, while international out-migration will be at 1,600 annually.



As a result, the Manitoba population is expected to grow by approximately 2,781 people annually over the forecast period or at an annual rate of 0.24%, as compared to 0.54% over the 1961 to 2002 period.

## Manitoba

### Housing

Housing starts increased by 2.1% in 2002 with 3,617 units compared to 2,963 units in 2001. Single dwelling units increased by 22.6% from 2,460 units in 2001 to 3,016 in 2002 while new multiple units were up 19.5% from 503 units in 2001 to 601 units in 2002. Total Manitoba building permits were up 19.2% in 2002 with residential building permits leading the way with an increase of 28.3% over 2001 levels. The value of institutional and governmental permits was \$117 million in 2002 compared to \$59 million in 2001.

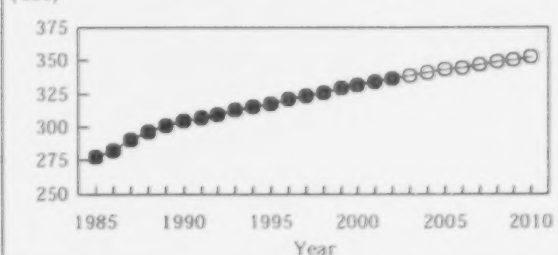
**Table V - Manitoba Housing Starts**

| Year | Total | Single Detach. | Mult. Dwell. |
|------|-------|----------------|--------------|
| 1989 | 4084  | 2966           | 1118         |
| 1990 | 3297  | 2847           | 450          |
| 1991 | 1950  | 1589           | 361          |
| 1992 | 2310  | 1683           | 627          |
| 1993 | 2425  | 1874           | 551          |
| 1994 | 3197  | 2441           | 756          |
| 1995 | 1963  | 1564           | 399          |
| 1996 | 2318  | 1875           | 443          |
| 1997 | 2612  | 2019           | 593          |
| 1998 | 2895  | 2368           | 527          |
| 1999 | 3133  | 2231           | 902          |
| 2000 | 2560  | 2348           | 212          |
| 2001 | 2963  | 2460           | 503          |
| 2002 | 3617  | 3016           | 601          |

The housing sector has experienced a significant decline throughout the last decade. On an annual basis, there were approximately 2,727 new housing units added during the last ten years relative to 6,813 new units in the previous three decades. Falling real disposable income as a result of poor job conditions for young adults, declining transfer payments, and a declining population in the 25-34 age cohort have contributed to lower demand for housing units. In fact, we have witnessed a drop of over 29,079 people in the 25-34 age cohort over the 1992 to 2002 period. This age cohort is commonly associated with first time home buyers.

Manitoba Hydro residential customers increased by 2,403 units in 2002, an increase of 289 units relative to 2001's increase of 2,114 units. The keys to housing affordability are low interest rates, stable house prices, and rising household income. The latter two variables have been rising slowly in the past year and falling mortgage rates have stimulated housing affordability in 2002.

**Fig. 7 - M.H. Residential Customers**  
(000)



With a modest increase expected in interest rates, and low population and higher income growth as a result of lower taxes, the number of new housing starts should trend towards the 2,250 units annually in the near and long term — down from the 2,500 units forecast in the 2002 Economic Outlook.

**Table VI - M.H. Residential Customers**

| Year | Manitoba Hydro Residential Customers (000) |
|------|--------------------------------------------|
| 1975 | 222                                        |
| 1980 | 261                                        |
| 1985 | 278                                        |
| 1990 | 305                                        |
| 1995 | 318                                        |
| 2001 | 334                                        |
| 2005 | 343                                        |
| 2010 | 352                                        |
| 2024 | 377                                        |

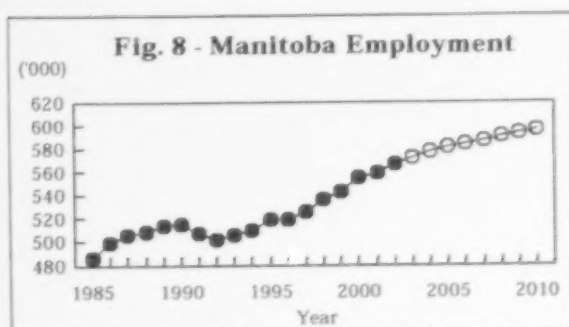
Manitoba Hydro residential metered customers are expected to increase by 2,639 units in 2003 and 2,234 units in 2004. The number of residential metered customers is expected to grow by an annual average of 1,830 units from 2005 to 2024. Throughout the forecast period, the level of new Manitoba Hydro residential customers is a function of Manitoba housing starts. The latter is a function of real per capita non-financial disposable income, people per housing stock, the spread between the 90 day T-Bill rate and the inflation rate, and the spread between the level of current unemployment rate and past unemployment rate.

Manitoba natural gas residential customers are expected to increase by 1,431 units in 2003 and 1,355 units in 2004. The number of residential metered customers is expected to grow by an annual average of 1,450 units from 2005 to 2024. This is also a function of Manitoba housing starts

## Manitoba

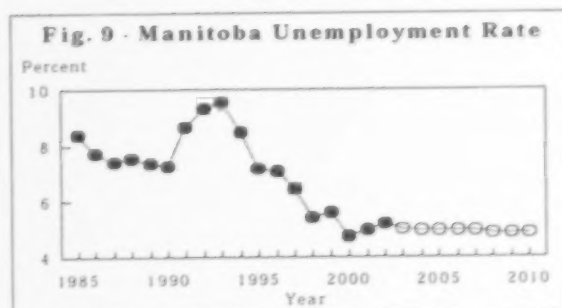
### Employment

The Manitoba economy created an unexpected 9,100 new jobs in 2002 — an increase of 1.6%.



The goods sector lost 2,662 jobs with 1,988 new jobs in the agriculture sector. The other primary sector, which includes mining, lost 512 jobs while utilities created 88 jobs in 2002. The construction and manufacturing sectors lost 2,312 and 1,914 jobs respectively in 2002.

The service sector created 11,762 new jobs with community, business, and personal services leading the way with the addition of 12,212 new jobs while transportation lost 1,513 jobs. However, trade added 1,287 jobs and public admin lost 212 jobs. The fire insurance and real estate sector lost 12 jobs in 2002.



Manitoba's participation rate increased from 68.1% in 2001 to 69.2% in 2002 — a record annual high. Male's participation rate increased to 75.7% in 2002 from 74.9% in 2001. Female's participation rate increased from 61.5% in 2001 to 62.8% in 2002. The ranks of the labour force grew by 10,433 people or 1.8% while the population 15 years and over increased moderately by 2,117 people or 0.2% growth. Growth of 1.6% in job creation compared to 1.8% growth in the labour force pushed the unemployment rate from 5.0% in 2001 to 5.2% in 2002.

As the unemployment rate falls relative to the past and economic growth strengthens, the labour participation rate will increase.

**Table VII -  
Manitoba Unemployment Rate**

| Year | Unemployment Rate (%) |
|------|-----------------------|
| 1965 | 2.5                   |
| 1970 | 5.2                   |
| 1975 | 4.3                   |
| 1980 | 5.3                   |
| 1985 | 8.4                   |
| 1990 | 7.3                   |
| 1995 | 7.2                   |
| 2001 | 4.9                   |
| 2005 | 5.0                   |
| 2010 | 4.9                   |
| 2015 | 4.6                   |
| 2024 | 3.7                   |

Over the last three decades, female and male participation rates have been going in opposite directions (male's declining while female's increasing). Because female's participation has been climbing faster than male's is decreasing, the overall rate has been climbing. In the future, the participation rate should trend around current levels of 69.2%.

As a result of strong demand for labour in 2002, Manitoba's industrial weekly wage rate rose by 2.0% in 2002 from \$591.4 in 2001 to \$603.2 in 2002.

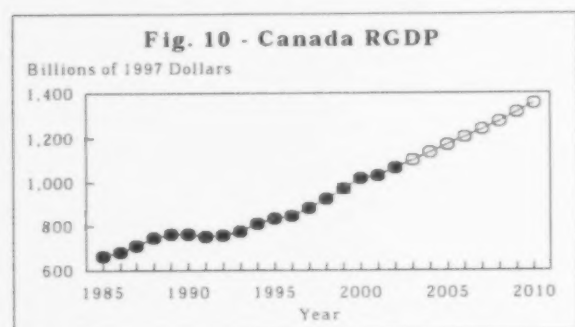
The labour market is expected to change dramatically over the next two decades as a result of two factors: aging population and baby boomers. The latter are expected to retire in great numbers over the next ten years. Public officials claim that up to 25% of public employees, 130,000 in total, can retire in the next five years. The lower fertility rates and net out-migration will cause the 15-64 year old cohort to shrink during the 2010-2024 period if current trends are maintained.

Employment is expected to grow at an annual rate of 0.5% over the forecast period, compared to 0.4% per annum growth in the labour force. Consequently, the unemployment rate is expected to trend from 5.0% in 2003 to 3.7% in 2024.

## Canada

### Real Gross Domestic Product

The Canadian economy posted an unexpected strong growth rate of 3.4% in 2002 — the strongest in the G-7 countries. Demand for durable goods such as cars and household appliances increased by 6.4% in 2002, while demand for semi-durable goods such as clothing increased by 3.8%. Demand for non-durables posted the weakest growth at 1.8%. The service sector, the steadiest component of all four consumption sectors, increased at an annual rate of 2.4%. Residential investment posted an increase of 16.0% as a result of strong demand in the housing sector. Business fixed investment was down 3.8% despite the healthy recovery in corporate profits of 6.2% over 2001 levels.



After a drop in business investments in 2002, the trade sector was the second source of weakness as both imports and exports posted a 0.8% increase in 2002.

Canadian retail trade was up 6.0% in 2002 with total sales of \$306.4 billion for the year compared to \$289.9 billion in 2001.

Canadian manufacturing shipments increased 1.9% in 2002 with total shipments of \$518.5 billion in 2002 compared to \$508.8 billion in 2001.

**Table VIII - Canada RGDP \$97B**

| Year      | Average 5 Year Growth (%) |
|-----------|---------------------------|
| 1965-1970 | 4.6                       |
| 1970-1975 | 6.8                       |
| 1975-1980 | 3.7                       |
| 1980-1985 | 2.6                       |
| 1985-1990 | 2.9                       |
| 1990-1995 | 1.7                       |
| 1995-2000 | 4.0                       |
| 2000-2005 | 2.9                       |
| 2005-2009 | 3.0                       |
| 2009-2024 | 2.4                       |

Real disposable income was up 2.5% in 2002, similar to the increase registered in 2001. The increase is due to higher employment growth and a drop in provincial and federal personal income taxes. On the other hand, there were sharp increases in cigarette taxes and transport taxes in 2002. Patterns in disposable income are critical to retailers and others depending on consumer spending. Real disposable income per capita is one measure of the standard of living. It measures ability to purchase in the marketplace. As Canada's population growth slows, it is important to examine the pace of per capita growth.

Canadian housing starts increased 26% from 162,733 units in 2001 to 205,034 units in 2002. Strong job growth, low mortgage rates, and the emergence of first-time home buyers were the main factors behind the highest level of new housing units since 1989. The housing market is expected to cool off in 2003, but it will remain a key source of strength within the Canadian economy. Residential building permits increased by 32.1% in 2002.

Unlike the recessions experienced at the beginning of the last two decades (1981-82 and 1991-92), the Canadian economy fared much better and posted 1.5% and 3.4% in 2001 and in 2002 respectively. The economy is expected to grow on average approximately 2.7% over the 2003-2009 period, anticipating a rebound in the United States' economy.

The 2003 Economic Outlook calls for a 2.4% long term growth, down slightly from last year's forecast. In the long term, the Canadian growth rate is based on employment growth of 1.0% and productivity growth of 1.4%.

## Canada

### Consumer Price Index

The Canadian annual rate of inflation dropped from 2.6% in 2001 to 2.2% in 2002. Throughout 2002, the monthly year-to-year rate of inflation oscillated between 1.0% and 4.3%. On an annual basis, food, transportation, and alcohol, beverage and tobacco were the major forces behind the increase. The shelter, household operation, health and personal care and recreation components of the CPI experienced moderate increases in 2002 while the clothing component experienced a modest drop of 0.8%. The inflation rate, which excludes food and energy due to their cyclical and seasonal nature, escalated at an annual rate of 2.7% in 2002. Both goods and service components of the CPI escalated at an annual rate of 1.7% and 2.9% respectively.

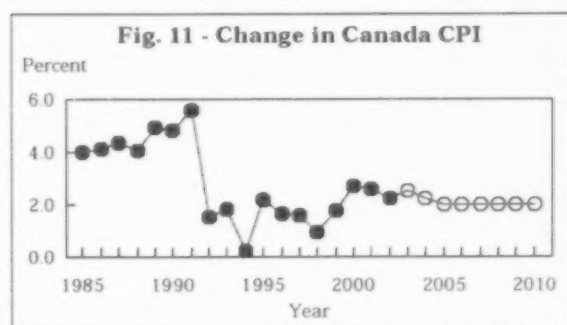


**Table IX - Canada CPI - Year over Year Change**

|                              | 2002<br>Average<br>% |
|------------------------------|----------------------|
| All Items                    | 2.2                  |
| Food                         | 2.6                  |
| Shelter                      | 0.9                  |
| Household Operations         | 1.4                  |
| Clothing & Footwear          | -0.8                 |
| Transportation               | 2.8                  |
| Health & Personal Care       | 1.1                  |
| Recn, Edu & Reading          | 1.6                  |
| Alc., Bev. & Tobacco         | 17.6                 |
| Goods                        | 1.7                  |
| Services                     | 2.9                  |
| All Items excl Food & Energy | 2.7                  |
| Energy                       | -2.0                 |

In 2002 the annual Canadian rate of inflation for food was 2.6% compared to 4.5% in 2001; 0.9% for shelter compared to 3.7% in 2001; 1.4% for household operation compared to 2.0% in 2001; -0.8% for clothing compared to 0.5% in 2001; 2.8% for transportation compared to

0.1% in 2001; 1.1% for health compared to 2.0% in 2001; 1.6% for recreation compared to 1.5% in 2001; 17.6% for tobacco and alcohol compared to 7.7% in 2001.

Weakening economic growth worldwide has contributed to lower energy price increases and the energy component dropped 2.0% in 2002. The Canadian fuel oil sub-component of the CPI decreased by 8.1% in 2002. Natural gas prices increased in 2000/01 but decreased by 18.1% in 2002 over 2001 levels. The electricity sub-component posted a significant price increase of 7.4% in 2002.

The GDP implicit price deflator, which is an overall measure of inflation for all goods and services produced and consumed, increased by 1.2% in 2002, up from the 1.0% increase posted in 2001.

The composite construction price index for Canada increased by 2.3% in 2002, down from the 2.9% increase registered for 2001. The increase was generated by an increase of 2.1% in the material component and a 2.5% increase in the wage component. The composite index is split approximately 50/50 between materials and wages.

The raw material price index decreased by 0.7% in 2002, led by decreases in mineral fuels, animal products, wood and non-ferrous metals. Vegetable products rebounded with an increase of 16.4% compared to 2001.

The industrial product price index (IPPI) rose mildly from 107.5 in 2001 to 107.6 in 2002. It should be noted that fluctuations in the IPPI are affected by fluctuations in the Canadian dollar. It is estimated that a 1% change in the Canadian dollar will change the IPPI by approximately 0.2%.

The rate of inflation is expected to be 3.5% in 2003, 2.5% in 2004, and to trend at 2.0%, the middle of the target range 1.0% to 3.0%, throughout the remainder of the forecast period, assuming that the current Bank of Canada monetary policy prevails.

**Table X - Canada Inflation Rate**

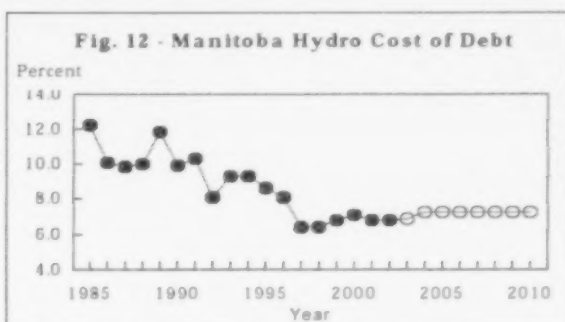
| Year      | CPI<br>(%) |
|-----------|------------|
| 1965-1970 | 3.8        |
| 1970-1975 | 7.4        |
| 1975-1980 | 8.7        |
| 1980-1985 | 7.4        |
| 1985-1990 | 4.5        |
| 1990-1995 | 2.2        |
| 1995-2000 | 1.7        |
| 2000-2005 | 2.3        |
| 2005-2009 | 2.0        |
| 2009-2024 | 2.0        |



## Canada

### Interest Rates

The bank rate was raised three times by the Bank of Canada in 2002. In early January, it stood at 2.25% but after three successive increases the bank rate stood at 3.00% at year-end. On an annual basis, the bank rate decreased from 4.31% in 2001 to 2.71% in 2002. The prime rate (the rate chartered banks charge their best customers) followed a similar trend to the bank rate. The annual average prime rate dropped from 5.81% in 2001 to 4.21% in 2002. Throughout 2002, the yield curve (spread between long-term and short-term interest rates) became steeper relative to 2000 and 2001. A steep yield curve tends to stimulate lending activity and domestic spending.



Throughout 2002, the Government of Canada long term bond rate oscillated between 5.37% and 6.02% and posted an annual rate of 5.66% for 2002 — a drop of 12 basis points relative to 2001. In the first half of 2002, the long-term rate oscillated in the 5.68%-6.00% range. It fell throughout the second half and finished at 5.37% at year end.

**Table XI - Range in Canadian Interest Rates**

|                | 2002<br>Average<br>% | 12<br>Month<br>Low<br>% | 12<br>Month<br>High<br>% |
|----------------|----------------------|-------------------------|--------------------------|
| Bank Rate      | 2.71                 | 2.25                    | 3.00                     |
| T-Bill Rate    | 2.59                 | 1.97                    | 3.00                     |
| Prime Rate     | 4.21                 | 3.75                    | 4.50                     |
| GOC 10Yr+ Rate | 5.66                 | 5.37                    | 6.00                     |

The Canada-US T-Bill interest rate differential was at its highest level in seven years in 2002. Except for 1999 and 2001, the short-term rate differential was negative for most of the 1996-2001 period. The annualized short-term interest rate differential was 0.98% in 2002 compared to 0.39% in 2001. On the other hand, the Canadian short term real rate was 0.34% in 2002 down from the 1.24% posted in 2001. The short term real interest rate in 2002 was about 300 basis points below the previous ten year

average. The U.S. equivalent was 0.01% in 2002 compared to 0.56% in 2001.

As stated above, long term rates fell moderately throughout 2002. On an annual basis, the long term rates fell 12 basis points from 5.78% in 2001 to 5.66% in 2002. The long term Canadian-US interest rate differential was positive at 1.06% in 2002 compared to 0.30% in 2001. The long term Canadian real interest rate increased slightly to 3.41% in 2002 from 3.24% in 2001 while the comparable US rate increased from 2.66% in 2001 to 3.02% in 2002. The long term Canadian-US interest real rate differential decreased from 0.59% in 2001 to 0.40% in 2002.

The 90 Day T-Bill rate is expected to be 4.5% while the GOC 10 year+ rate is forecast to trend at 6.0%.

The forecast for Manitoba Hydro's long term new debt rates, largely based on the GOC 10 year+ rate, includes a small differential reflecting the credit rating of the Province relative to the government of Canada and the Provincial guarantee fee.

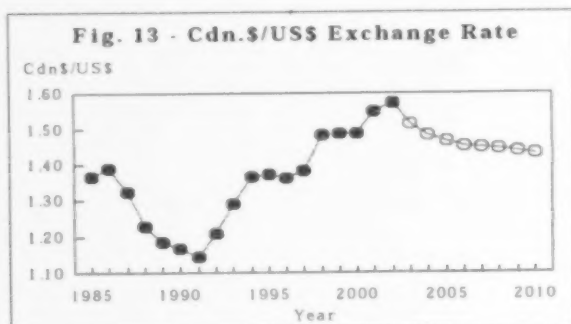
**Table XII - Interest Rates**

| Year | 90 Day<br>T-Bill<br>Rate<br>(%) | GOC<br>10 Yr+<br>Rate<br>(%) |
|------|---------------------------------|------------------------------|
| 1970 | 5.99                            | 7.91                         |
| 1975 | 7.40                            | 9.04                         |
| 1980 | 12.79                           | 12.48                        |
| 1985 | 9.43                            | 11.04                        |
| 1990 | 12.81                           | 10.85                        |
| 1995 | 6.89                            | 8.28                         |
| 1999 | 4.72                            | 5.69                         |
| 2000 | 5.49                            | 5.89                         |
| 2001 | 3.78                            | 5.78                         |
| 2002 | 2.59                            | 5.66                         |
| 2005 | 4.50                            | 6.00                         |
| 2010 | 4.50                            | 6.00                         |
| 2015 | 4.50                            | 6.00                         |
| 2024 | 4.50                            | 6.00                         |

## Canada

### Exchange Rate

The Canadian dollar posted an annual rate of \$1.5703 US, a depreciation of 1.4% with respect to 2001 where the Canadian dollar was \$1.5489 US. However, the dollar stood at \$1.6003 US in January and started to appreciate until the middle of the year. After depreciating for most of the third quarter, the Canadian dollar appreciated in the final quarter to reach \$1.5593 US by year end.



In spite of a modest decline in 2002, the Canadian dollar is starting to appreciate. Owing to the sharp contrast in employment trends with respect to the U.S., investors have taken notice of Canada's superior economic fundamentals and wider interest-rate spreads vis-à-vis the United States. However, the Canadian currency continues to underperform other major currencies, especially the Euro. It has also stumbled in the past during periods of political uncertainty. Moreover, the dollar has also been undermined by fears that an Iraqi war will torpedo the United States' economy and as a result, harm Canadian exports and commodity prices. This negative assessment is despite the fact that Canada is a net exporter of energy products.

**Table XIII - Range in Exchange Rate**

|               | 2002<br>Average | 12<br>Month<br>Low | 12<br>Month<br>High |
|---------------|-----------------|--------------------|---------------------|
| Cdn. \$/US \$ | 1.57            | 1.60               | 1.53                |
| US \$/Cdn. \$ | 0.64            | 0.62               | 0.65                |

Nevertheless, the medium term outlook for the Canadian dollar remains bright. President Bush's recent fiscal package of hefty tax cuts underscores the diverging trends in fiscal balances between the two countries, with the United States racking up bigger deficits and Canada running surpluses. Similarly, external balances continue to trend in opposite directions, with Canada running a current account surplus of 2% of GDP while the United States is racking up deficits in the order of

5%. The "overvalued" US currency is bound to depreciate further in the medium term to stabilize the deterioration in the United States' external accounts.

Consequently, the Canadian dollar will appreciate to \$1.51 US in 2003 and \$1.48 US in 2004 as Canada's economic fundamentals remain intact.

**Table XIV - Exchange Rate**

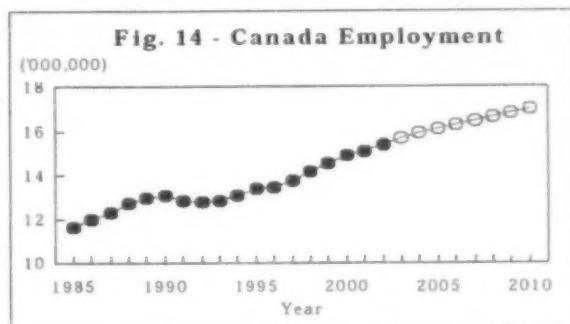
| Year | US\$/<br>Cdn.\$ | Cdn.\$/<br>US\$ |
|------|-----------------|-----------------|
| 1970 | 0.96            | 1.04            |
| 1975 | 0.98            | 1.02            |
| 1980 | 0.86            | 1.17            |
| 1985 | 0.73            | 1.37            |
| 1990 | 0.86            | 1.17            |
| 1995 | 0.73            | 1.37            |
| 1996 | 0.73            | 1.36            |
| 1997 | 0.72            | 1.38            |
| 1998 | 0.67            | 1.48            |
| 2000 | 0.67            | 1.49            |
| 2001 | 0.65            | 1.55            |
| 2002 | 0.64            | 1.57            |
| 2005 | 0.68            | 1.46            |
| 2010 | 0.70            | 1.43            |
| 2024 | 0.75            | 1.33            |

The fundamentals for the Canadian dollar are still intact and strong for the long term. A lower Canadian inflation rate, vis-à-vis that of the United States, a positive current account balance, and surpluses in Federal and provincial fiscal balances should help the Canadian currency to appreciate towards \$1.43 US by 2010 and \$1.33 US in 2024.

## Canada

### Employment

The Canadian economy generated an unexpected total of 335,000 jobs in 2002, up from 167,000 jobs created in 2001. The employment level increased by 2.2% in 2002. However, the Help-Wanted Index, an indicator of labour demand, dropped 17.4% in 2002 from 149 in 2001 to 123 in 2002.



The goods producing sector gained 81,000 jobs in 2002 versus a drop of 6,000 jobs in 2001. The agriculture sector added 1,000 jobs, while manufacturing added 51,000 jobs and construction added 40,000 jobs. The primary sector lost 20,000 jobs in 2002 while the utilities sector added 9,000 jobs. Although experiencing a loss in employment in 2001, the goods sector has added 604,000 jobs over the 1993-2002 period and current levels of employment are approximately equal to the levels experienced in the late 1980's.

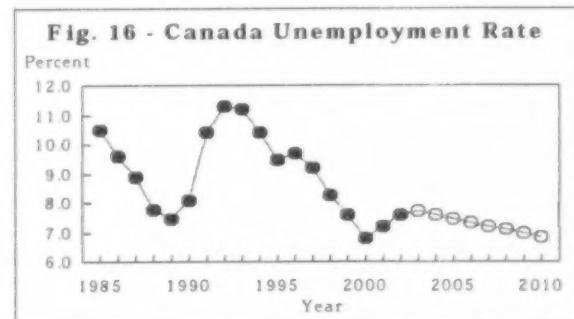
Growth in the service sector created 254,000 jobs in 2002 compared to 171,000 jobs in 2001. The community and personal business sector created the bulk of the new service jobs as 192,000 jobs were added. The wholesale and retail trade sector added 46,000 jobs, the transportation and communication sector lost 17,000 jobs and the fire insurance and real estate sector added 21,000 jobs. The public administration sector added 12,000 jobs.

In 2002, there was a higher increase in the labour force of 2.7% relative to the creation of jobs of 2.2% and as a result the unemployment rate increased from 7.2% in 2001 to an annual average of 7.7% in 2002. The participation rate increased from 66.0% in 2001 to 66.9% in 2002 and the ranks of the population age group 15+ years increased by 332,000 people and the labour force increased by 443,000 people. Male's participation rate increased from 72.5% in 2001 to 73.3% in 2002 while female's participation rate increased from 59.7% to 60.7% for the same period. Male's participation rate has fallen from 76-77% levels experienced in the early 1990's while

female's participation rate has trended in the 58-59% range in the 1990's.



The increase in the unemployment rate helped to increase the ranks of the jobless by 108,000 from 1,169,000 in 2001 to 1,277,000 in 2002. It should be noted that 186,000 new jobs created in 2002 were full-time — about 55% of the total. The employment/population group 15 years and over increased from 61.3% in 2001 to 61.8% in 2002. The industrial wage escalated from \$665.09 in 2001 to \$677.93 in 2002 — an increase of 1.9%.



In the long term, the unemployment rate should trend from current levels of 7.2% towards 5.0% by 2024, resulting from a higher growth rate in employment relative to the labour force. The slower growth in the labour force is, in part, due to an aging population.



## U.S.A.

### Real Gross National Product

In 2002, the United States' economy registered an annual real growth of 2.4% after posting a modest real gain of 0.3% in 2001. The U.S. economy had a year of fits and starts characterized with strong growth in demand of consumer goods and new housing units, but experienced negative employment growth as a result of scandals and a shortfall in business investments.

The U.S. economy was fueled by two sectors, consumption and government expenditures. Personal consumption expenditures were up 3.1% over last year's level while the government sector posted an increase of 4.4% growth. Exports fell 1.3% in 2002 while imports increased by 3.5% — this has a positive effect on Canadian exports. Consequently, the merchandise trade imbalance continues to dog the U.S. economy and has fueled protectionist sentiments in key sectors and regions.

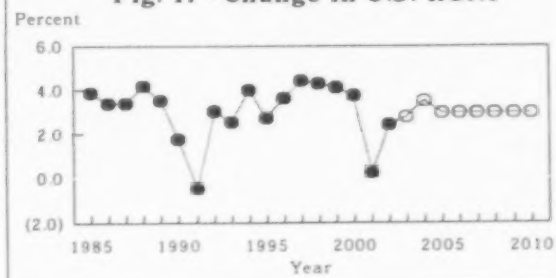
The U.S. housing sector increased significantly in 2002. Housing starts were up 6.8% in 2002 from 1,603,000 units in 2001 to 1,711,000 units in 2002. Retail sales were up by 2.1% in 2002 from \$3,488.6 billion in 2001 to \$3,560.2 billion in 2002.

The U.S. economy and its thirst for non-US goods caused the merchandise trade deficit to increase from \$427.2 billion in 2001 to a record \$484.4 billion in 2002, 4.6% of GDP.

The U.S. economy continues to be a source of growth in the Canadian economy. With the Canadian consumption-output ratio falling throughout the 1990's, external trade now represents well over 40% of the total Canadian economy. U.S. exports represent some 86% of that amount. Canada and the U.S. are the two biggest trading nations in the world.

The U.S. economy is expected to grow 2.8% in 2003 and rebound in 2004 and post an annual growth rate of 3.5%. Between 2005 and 2009, real GDP growth is expected to grow at 3.0% per year. From 2009 to the end of the forecast period, real economic growth is anticipated to be 3.0%. The long-term growth in real GDP is based on 1.9% growth in productivity and 1.1% in employment growth. The tax cuts announced in the last federal budget are expected to stimulate long-term investments.

Fig. 17 - Change in U.S. RGNP

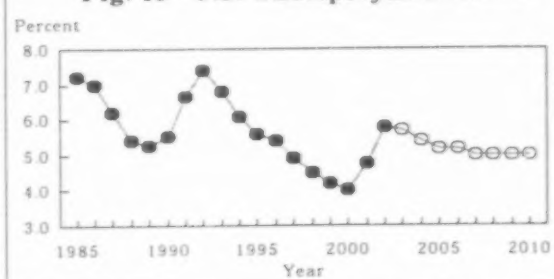


### Employment

For a second consecutive year, the U.S. economy experienced a drop in employment. The U.S. economy lost 815,000 jobs in 2002 compared to a loss 187,000 jobs in 2001. The ranks of the labour force increased by 671,000 people or 0.5% growth. A slightly lower growth of 0.5% in the labour force compared to 1.0% in the source population 15 years and over caused the participation rate to decrease from 67.0% in 2001 to 66.6% in 2002. Weak economic growth along with massive layoffs in technology and airline industries helped pushed the annual unemployment rate from 4.8% in 2001 to 5.8% in 2002. The unemployment rate oscillated within a band of 5.5 to 6.0 throughout 2002. The weekly average hours remained at 34.16 hours in 2002 similar to 2001, while the hourly pay increased by 3.0% from \$14.34 per hour in 2001 to \$14.78 per hour in 2002.

In the short term, the U.S. unemployment rate should decrease from current levels of 5.7% to 5.2% in 2006. In the long term, the unemployment rate should trend towards the 5.0% level as employment is expected to grow at an annual rate of 1.1% throughout the forecast period.

Fig. 18 - U.S. Unemployment Rate



## U.S.A.

### Consumer Price Index

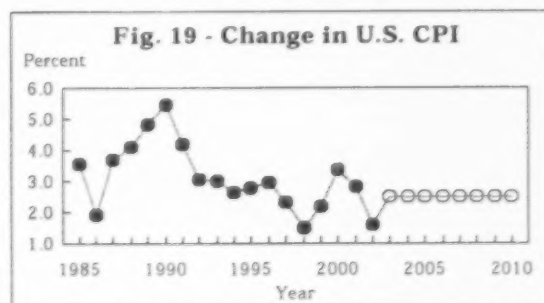
The U.S. rate of inflation, as measured by the annual rate of change in the CPI, increased by 1.6% in 2002 compared to 2.8% in 2001. The U.S. price deflator increased at an annual rate of 1.1% in 2002. Commodity prices, as measured by the PPI — manufactured goods, increased by 1.4% in 2002 compared to the decrease of 2.0% registered in 2001. The lower increase was the result of weakening energy prices.

**Table XV - USA CPI  
Year Over Year Change**

|                | 2002<br>Average<br>% |
|----------------|----------------------|
| All items      | 1.6                  |
| Food           | 1.8                  |
| Housing        | 2.2                  |
| Transportation | -0.9                 |

The average hourly earnings escalated by 3.0% which is above the measures of inflation stated above. It should be noted that wage costs represent 60% of the total cost of producing most goods and services and wage increases are usually added on to the price of goods and services. Weaker economic growth and falling goods prices are responsible for moderating the inflation increase in 2002.

The current rate of unemployment at 5.8%, combined with lower economic growth compared to the potential growth rate, had dampened the inflation threat in 2002.



In the long run, excluding the occurrence of supply shocks, inflation is primarily under the control of the central bank. In the near term, the USA CPI is expected to be 2.25% for 2003 and 2004 respectively. The long-term inflation rate should trend around the 2.5% level.

### Interest Rates

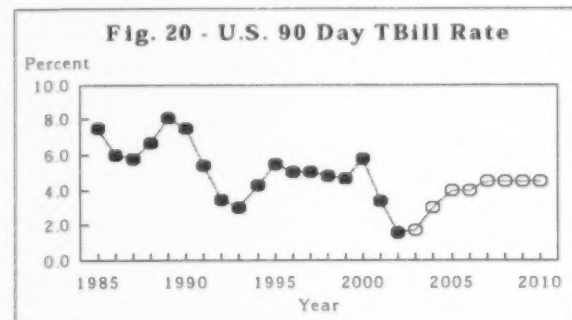
The Federal Open Market Committee (FOMC), the arm of the Federal Reserve Board responsible for monetary policy that sets short-term interest rates, intervened only once in 2002. The rate was dropped to 1.25% in November after sitting at 1.75% for most of 2002.

**Table XVI - USA Interest Rates**

|                | 2002<br>Average<br>% | 12<br>Month<br>Low<br>% | 12<br>Month<br>High<br>% |
|----------------|----------------------|-------------------------|--------------------------|
| Federal Fund   | 1.66                 | 1.23                    | 1.79                     |
| T-Bill         | 1.60                 | 1.19                    | 1.79                     |
| Govt 5 Year    | 3.76                 | 2.83                    | 4.85                     |
| Govt 10 Year + | 4.61                 | 3.77                    | 5.41                     |

In 2002, the T-Bill rate oscillated between 1.19% and 1.79%. At an annual rate, the T-Bill rate was 1.60% in 2002 compared to 3.39% in 2001. The prime rate stood at 4.75% from January to October but fell to 4.25% in November and December. The annual prime rate was 4.67% in 2002 compared to 6.79% in 2001.

The long term government bond rate decreased from 5.49% in 2001 to 4.61% in 2002.



In the long term, as the economy eases up, short-term interest rates should trend towards 4.5%, while long term rates trend around current levels of 5.75% — slightly higher relative to last year's Economic Outlook.

# Manitoba Economic Statistics

| Year            | Popu-<br>lation<br>'000 | Popu-<br>lation<br>% | Unempl.<br>Rate<br>% | Real<br>GDP<br>97\$m | Real<br>GDP<br>% | CPI<br>92=100 | CPI<br>% | M.H.<br>Res. Cus.<br>'000 |
|-----------------|-------------------------|----------------------|----------------------|----------------------|------------------|---------------|----------|---------------------------|
| 1978            | 1,041                   | 0.3                  | 6.6                  | 21,277               | 2.0              | 45.2          | 8.5      | 249                       |
| 1979            | 1,037                   | -0.4                 | 5.3                  | 21,193               | -0.4             | 49.3          | 9.1      | 259                       |
| 1980            | 1,035                   | -0.3                 | 5.3                  | 21,447               | 1.2              | 54.2          | 9.9      | 261                       |
| 1981            | 1,036                   | 0.2                  | 6.1                  | 22,763               | 6.1              | 60.2          | 11.1     | 263                       |
| 1982            | 1,047                   | 1.0                  | 8.3                  | 22,627               | -0.6             | 65.5          | 8.8      | 265                       |
| 1983            | 1,061                   | 1.4                  | 9.6                  | 22,932               | 1.4              | 69.9          | 6.7      | 267                       |
| 1984            | 1,072                   | 1.0                  | 8.7                  | 24,597               | 7.3              | 72.5          | 3.7      | 273                       |
| 1985            | 1,082                   | 1.0                  | 8.4                  | 25,198               | 2.4              | 75.5          | 4.1      | 278                       |
| 1986            | 1,092                   | 0.9                  | 7.7                  | 26,227               | 4.1              | 78.9          | 4.5      | 283                       |
| 1987            | 1,098                   | 0.6                  | 7.4                  | 26,536               | 1.2              | 82.2          | 4.2      | 291                       |
| 1988            | 1,102                   | 0.4                  | 7.5                  | 26,581               | 0.2              | 85.6          | 4.1      | 297                       |
| 1989            | 1,104                   | 0.1                  | 7.3                  | 27,193               | 2.3              | 89.7          | 4.8      | 301                       |
| 1990            | 1,106                   | 0.2                  | 7.3                  | 27,894               | 2.6              | 93.8          | 4.6      | 305                       |
| 1991            | 1,110                   | 0.4                  | 8.6                  | 26,621               | -4.6             | 98.6          | 5.1      | 307                       |
| 1992            | 1,113                   | 0.3                  | 9.3                  | 26,652               | 0.1              | 100.0         | 1.4      | 310                       |
| 1993            | 1,118                   | 0.5                  | 9.6                  | 26,885               | 0.9              | 102.7         | 2.7      | 312                       |
| 1994            | 1,124                   | 0.5                  | 8.5                  | 27,848               | 3.6              | 104.1         | 1.4      | 315                       |
| 1995            | 1,130                   | 0.5                  | 7.2                  | 28,094               | 0.9              | 106.9         | 2.7      | 318                       |
| 1996            | 1,134                   | 0.4                  | 7.1                  | 28,872               | 2.8              | 109.2         | 2.2      | 320                       |
| 1997            | 1,137                   | 0.2                  | 6.4                  | 29,758               | 3.1              | 111.6         | 2.2      | 323                       |
| 1998            | 1,138                   | 0.1                  | 5.4                  | 31,011               | 4.2              | 113.0         | 1.3      | 326                       |
| 1999            | 1,143                   | 0.4                  | 5.6                  | 31,585               | 1.9              | 115.2         | 1.9      | 329                       |
| 2000            | 1,146                   | 0.3                  | 4.7                  | 32,341               | 2.4              | 118.1         | 2.5      | 331                       |
| 2001            | 1,149                   | 0.2                  | 4.9                  | 32,838               | 1.5              | 121.2         | 2.6      | 334                       |
| 2002            | 1,151                   | 0.2                  | 5.2                  | 33,865               | 3.1              | 123.1         | 1.6      | 336                       |
| <b>Forecast</b> |                         |                      |                      |                      |                  |               |          |                           |
| 2003            | 1,154                   | 0.3                  | 5.0                  | 34,915               | 3.1              | 126.8         | 3.0      | 339                       |
| 2004            | 1,158                   | 0.3                  | 5.0                  | 35,962               | 3.0              | 130.0         | 2.5      | 341                       |
| 2005            | 1,161                   | 0.3                  | 5.0                  | 36,861               | 2.5              | 132.6         | 2.0      | 343                       |
| 2006            | 1,165                   | 0.3                  | 5.0                  | 37,599               | 2.0              | 135.2         | 2.0      | 345                       |
| 2007            | 1,168                   | 0.3                  | 5.0                  | 38,351               | 2.0              | 137.9         | 2.0      | 347                       |
| 2008            | 1,171                   | 0.3                  | 4.9                  | 39,080               | 1.9              | 140.7         | 2.0      | 349                       |
| 2009            | 1,174                   | 0.3                  | 4.9                  | 39,767               | 1.8              | 143.5         | 2.0      | 350                       |
| 2010            | 1,177                   | 0.3                  | 4.9                  | 40,472               | 1.8              | 146.4         | 2.0      | 352                       |
| 2011            | 1,180                   | 0.3                  | 4.9                  | 41,176               | 1.7              | 149.3         | 2.0      | 354                       |
| 2012            | 1,183                   | 0.3                  | 4.9                  | 41,818               | 1.6              | 152.3         | 2.0      | 356                       |
| 2013            | 1,186                   | 0.3                  | 4.8                  | 42,501               | 1.6              | 155.3         | 2.0      | 358                       |
| 2014            | 1,189                   | 0.2                  | 4.7                  | 43,185               | 1.6              | 158.4         | 2.0      | 360                       |
| 2015            | 1,192                   | 0.2                  | 4.6                  | 43,869               | 1.6              | 161.6         | 2.0      | 362                       |
| 2016            | 1,195                   | 0.2                  | 4.5                  | 44,556               | 1.6              | 164.8         | 2.0      | 363                       |
| 2017            | 1,198                   | 0.2                  | 4.4                  | 45,243               | 1.5              | 168.1         | 2.0      | 365                       |
| 2018            | 1,200                   | 0.2                  | 4.3                  | 45,934               | 1.5              | 171.5         | 2.0      | 367                       |
| 2019            | 1,203                   | 0.2                  | 4.2                  | 46,626               | 1.5              | 174.9         | 2.0      | 369                       |
| 2020            | 1,205                   | 0.2                  | 4.1                  | 47,320               | 1.5              | 178.4         | 2.0      | 371                       |
| 2021            | 1,207                   | 0.2                  | 4.0                  | 48,018               | 1.5              | 182.0         | 2.0      | 372                       |
| 2022            | 1,209                   | 0.2                  | 3.9                  | 48,717               | 1.5              | 185.6         | 2.0      | 374                       |
| 2023            | 1,211                   | 0.2                  | 3.8                  | 49,419               | 1.4              | 189.3         | 2.0      | 376                       |
| 2024            | 1,213                   | 0.2                  | 3.7                  | 50,124               | 1.4              | 193.1         | 2.0      | 377                       |

# Canada Economic Statistics

| Year     | Real GDP<br>97\$b | Real GDP<br>% | CPI<br>92=100 | CPI<br>% | 90 Day<br>TBill<br>Rate<br>% | GOC<br>10 Yr+<br>Rate<br>% | Unempl.<br>Rate<br>% | Cdn./<br>U.S. \$ |
|----------|-------------------|---------------|---------------|----------|------------------------------|----------------------------|----------------------|------------------|
| 1978     | 554               | 4.1           | 43.6          | 9.0      | 8.68                         | 9.27                       | 8.4                  | 1.14             |
| 1979     | 577               | 4.2           | 47.6          | 9.0      | 11.69                        | 10.21                      | 7.5                  | 1.17             |
| 1980     | 585               | 1.4           | 52.4          | 10.2     | 12.79                        | 12.48                      | 7.5                  | 1.17             |
| 1981     | 600               | 2.6           | 58.9          | 12.4     | 17.72                        | 15.22                      | 7.6                  | 1.20             |
| 1982     | 583               | -2.9          | 65.3          | 10.8     | 13.66                        | 14.26                      | 11.0                 | 1.23             |
| 1983     | 599               | 2.7           | 69.1          | 5.9      | 9.31                         | 11.79                      | 11.9                 | 1.23             |
| 1984     | 634               | 5.8           | 72.1          | 4.3      | 11.06                        | 12.75                      | 11.3                 | 1.30             |
| 1985     | 664               | 4.8           | 75.0          | 4.0      | 9.43                         | 11.04                      | 10.5                 | 1.37             |
| 1986     | 680               | 2.4           | 78.1          | 4.2      | 8.97                         | 9.52                       | 9.6                  | 1.39             |
| 1987     | 709               | 4.3           | 81.5          | 4.3      | 8.15                         | 9.95                       | 8.9                  | 1.33             |
| 1988     | 744               | 5.0           | 84.8          | 4.0      | 9.48                         | 10.22                      | 7.8                  | 1.23             |
| 1989     | 764               | 2.6           | 89.0          | 5.0      | 12.05                        | 9.92                       | 7.5                  | 1.18             |
| 1990     | 765               | 0.2           | 93.3          | 4.8      | 12.81                        | 10.85                      | 8.1                  | 1.17             |
| 1991     | 749               | -2.1          | 98.5          | 5.6      | 8.73                         | 9.76                       | 10.4                 | 1.15             |
| 1992     | 756               | 0.9           | 100.0         | 1.5      | 6.41                         | 8.77                       | 11.3                 | 1.21             |
| 1993     | 774               | 2.3           | 101.8         | 1.9      | 4.84                         | 7.84                       | 11.2                 | 1.29             |
| 1994     | 811               | 4.8           | 102.0         | 0.2      | 5.54                         | 8.63                       | 10.4                 | 1.37             |
| 1995     | 833               | 2.8           | 104.2         | 2.2      | 6.89                         | 8.28                       | 9.5                  | 1.37             |
| 1996     | 847               | 1.6           | 105.9         | 1.6      | 4.21                         | 7.49                       | 9.7                  | 1.36             |
| 1997     | 883               | 4.2           | 107.6         | 1.6      | 3.25                         | 6.42                       | 9.2                  | 1.38             |
| 1998     | 919               | 4.1           | 108.6         | 0.9      | 4.73                         | 5.47                       | 8.3                  | 1.48             |
| 1999     | 968               | 5.4           | 110.5         | 1.7      | 4.72                         | 5.69                       | 7.6                  | 1.49             |
| 2000     | 1,012             | 4.5           | 113.5         | 2.7      | 5.49                         | 5.89                       | 6.8                  | 1.49             |
| 2001     | 1,028             | 1.5           | 116.4         | 2.6      | 3.78                         | 5.78                       | 7.2                  | 1.55             |
| 2002     | 1,062             | 3.4           | 119.0         | 2.2      | 2.59                         | 5.66                       | 7.7                  | 1.57             |
| Forecast |                   |               |               |          |                              |                            |                      |                  |
| 2003     | 1,095             | 3.1           | 123.2         | 3.5      | 3.50                         | 5.50                       | 7.2                  | 1.48             |
| 2004     | 1,132             | 3.3           | 126.2         | 2.5      | 4.50                         | 6.00                       | 7.1                  | 1.48             |
| 2005     | 1,165             | 3.0           | 128.8         | 2.0      | 4.50                         | 6.00                       | 7.0                  | 1.46             |
| 2006     | 1,200             | 3.0           | 131.3         | 2.0      | 4.50                         | 6.00                       | 6.9                  | 1.45             |
| 2007     | 1,236             | 3.0           | 134.0         | 2.0      | 4.50                         | 6.00                       | 6.8                  | 1.44             |
| 2008     | 1,274             | 3.0           | 136.7         | 2.0      | 4.50                         | 6.00                       | 6.7                  | 1.44             |
| 2009     | 1,312             | 3.0           | 139.4         | 2.0      | 4.50                         | 6.00                       | 6.6                  | 1.43             |
| 2010     | 1,351             | 3.0           | 142.2         | 2.0      | 4.50                         | 6.00                       | 6.5                  | 1.43             |
| 2011     | 1,388             | 2.8           | 145.0         | 2.0      | 4.50                         | 6.00                       | 6.4                  | 1.42             |
| 2012     | 1,426             | 2.8           | 147.9         | 2.0      | 4.50                         | 6.00                       | 6.3                  | 1.41             |
| 2013     | 1,462             | 2.5           | 150.9         | 2.0      | 4.50                         | 6.00                       | 6.2                  | 1.41             |
| 2014     | 1,499             | 2.5           | 153.9         | 2.0      | 4.50                         | 6.00                       | 6.1                  | 1.40             |
| 2015     | 1,536             | 2.5           | 157.0         | 2.0      | 4.50                         | 6.00                       | 5.9                  | 1.39             |
| 2016     | 1,575             | 2.5           | 160.1         | 2.0      | 4.50                         | 6.00                       | 5.8                  | 1.39             |
| 2017     | 1,614             | 2.5           | 163.3         | 2.0      | 4.50                         | 6.00                       | 5.7                  | 1.38             |
| 2018     | 1,650             | 2.3           | 166.6         | 2.0      | 4.50                         | 6.00                       | 5.6                  | 1.37             |
| 2019     | 1,687             | 2.3           | 169.9         | 2.0      | 4.50                         | 6.00                       | 5.5                  | 1.36             |
| 2020     | 1,725             | 2.3           | 173.3         | 2.0      | 4.50                         | 6.00                       | 5.4                  | 1.36             |
| 2021     | 1,764             | 2.3           | 176.8         | 2.0      | 4.50                         | 6.00                       | 5.3                  | 1.35             |
| 2022     | 1,804             | 2.3           | 180.3         | 2.0      | 4.50                         | 6.00                       | 5.2                  | 1.34             |
| 2023     | 1,844             | 2.3           | 183.9         | 2.0      | 4.50                         | 6.00                       | 5.1                  | 1.34             |
| 2024     | 1,886             | 2.3           | 187.6         | 2.0      | 4.50                         | 6.00                       | 5.0                  | 1.33             |

1

**CCC-NFAAT-S-15**

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**Provide System Load Forecast 2003/04 to 2023/24**

4

5

System Load Forecast 2003/04 to 2023/24 attached. (see CCC/NFAAT/S/11 for comparison)

August 08, 2003

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Table 1

| MANITOBA HYDRO NET ELECTRIC LOAD FORECAST<br>2002/03 - 2023/24                      |                           |      |                        |      |                  |
|-------------------------------------------------------------------------------------|---------------------------|------|------------------------|------|------------------|
| Fiscal Year                                                                         | Net Firm Energy<br>(GW.h) | %    | Net Total Peak<br>(MW) | %    | Load Factor<br>% |
| 2002/03 Actual                                                                      | 21940                     | 7.1% | 3916                   | 4.1% | 64.0%            |
| Weather                                                                             | -272                      |      | 14                     |      |                  |
| 2002/03 Adjusted                                                                    | 21668                     | 4.5% | 3930                   | 4.3% | 62.9%            |
| 2003/04                                                                             | 22171                     | 2.3% | 3956                   | 0.7% | 64.0%            |
| 2004/05                                                                             | 22690                     | 2.3% | 4028                   | 1.8% | 64.3%            |
| 2005/06                                                                             | 22976                     | 1.3% | 4053                   | 0.6% | 64.7%            |
| 2006/07                                                                             | 23262                     | 1.2% | 4088                   | 0.9% | 65.0%            |
| 2007/08                                                                             | 23554                     | 1.3% | 4126                   | 0.9% | 65.2%            |
| 2008/09                                                                             | 23783                     | 1.0% | 4153                   | 0.7% | 65.4%            |
| 2009/10                                                                             | 24009                     | 1.0% | 4180                   | 0.7% | 65.6%            |
| 2010/11                                                                             | 24203                     | 0.8% | 4201                   | 0.5% | 65.8%            |
| 2011/12                                                                             | 24430                     | 0.9% | 4228                   | 0.6% | 66.0%            |
| 2012/13                                                                             | 24680                     | 1.0% | 4258                   | 0.7% | 66.2%            |
| 10 Year Avg.                                                                        |                           | 1.3% |                        | 0.8% |                  |
| 2013/14                                                                             | 24927                     | 1.0% | 4296                   | 0.9% | 66.2%            |
| 2014/15                                                                             | 25191                     | 1.1% | 4338                   | 1.0% | 66.3%            |
| 2015/16                                                                             | 25458                     | 1.1% | 4380                   | 1.0% | 66.4%            |
| 2016/17                                                                             | 25729                     | 1.1% | 4422                   | 1.0% | 66.4%            |
| 2017/18                                                                             | 26001                     | 1.1% | 4465                   | 1.0% | 66.5%            |
| 2018/19                                                                             | 26274                     | 1.1% | 4508                   | 1.0% | 66.5%            |
| 2019/20                                                                             | 26576                     | 1.1% | 4556                   | 1.1% | 66.6%            |
| 2020/21                                                                             | 26847                     | 1.0% | 4599                   | 0.9% | 66.6%            |
| 2021/22                                                                             | 27143                     | 1.1% | 4646                   | 1.0% | 66.7%            |
| 2022/23                                                                             | 27436                     | 1.1% | 4692                   | 1.0% | 66.8%            |
| 2023/24                                                                             | 27675                     | 0.9% | 4730                   | 0.8% | 66.8%            |
| 21 Year Avg.                                                                        |                           | 1.2% |                        | 0.9% |                  |
| - See the Glossary of Terms for a definition of Net Firm Energy and Net Total Peak. |                           |      |                        |      |                  |

Table 2

| ENERGY SALES TO MANITOBA HYDRO CUSTOMERS |             |                 |                         |                                  |      |              |                                  |
|------------------------------------------|-------------|-----------------|-------------------------|----------------------------------|------|--------------|----------------------------------|
| 2002/03 - 2023/24 (GW.h)                 |             |                 |                         |                                  |      |              |                                  |
| (Base Forecast)                          |             |                 |                         |                                  |      |              |                                  |
| Fiscal Year                              | Residential | General Service | Area & Roadway Lighting | Manitoba Hydro Sales Incl Diesel |      | Total Diesel | Manitoba Hydro Sales Excl Diesel |
| 2002/03 Actual                           | 6361        | 12796           | 90                      | 19246                            | 8.1% | 10           | 19236                            |
| 2003/04                                  | 6148        | 13075           | 90                      | 19314                            | 0.4% | 11           | 19303                            |
| 2004/05                                  | 6191        | 13548           | 91                      | 19830                            | 2.7% | 12           | 19818                            |
| 2005/06                                  | 6229        | 13729           | 92                      | 20051                            | 1.1% | 13           | 20038                            |
| 2006/07                                  | 6268        | 13931           | 93                      | 20292                            | 1.2% | 14           | 20278                            |
| 2007/08                                  | 6309        | 14117           | 93                      | 20519                            | 1.1% | 15           | 20504                            |
| 2008/09                                  | 6348        | 14278           | 94                      | 20720                            | 1.0% | 16           | 20704                            |
| 2009/10                                  | 6388        | 14435           | 95                      | 20919                            | 1.0% | 16           | 20903                            |
| 2010/11                                  | 6428        | 14594           | 96                      | 21118                            | 1.0% | 17           | 21101                            |
| 2011/12                                  | 6469        | 14762           | 96                      | 21327                            | 1.0% | 18           | 21309                            |
| 2012/13                                  | 6510        | 14939           | 97                      | 21546                            | 1.0% | 19           | 21527                            |
| 2013/14                                  | 6552        | 15113           | 98                      | 21762                            | 1.0% | 20           | 21742                            |
| 2014/15                                  | 6596        | 15299           | 99                      | 21994                            | 1.1% | 20           | 21974                            |
| 2015/16                                  | 6637        | 15487           | 99                      | 22224                            | 1.0% | 21           | 22203                            |
| 2016/17                                  | 6680        | 15676           | 100                     | 22457                            | 1.0% | 22           | 22435                            |
| 2017/18                                  | 6724        | 15865           | 101                     | 22690                            | 1.0% | 23           | 22667                            |
| 2018/19                                  | 6768        | 16054           | 102                     | 22924                            | 1.0% | 23           | 22901                            |
| 2019/20                                  | 6814        | 16244           | 103                     | 23160                            | 1.0% | 24           | 23136                            |
| 2020/21                                  | 6861        | 16434           | 103                     | 23398                            | 1.0% | 25           | 23373                            |
| 2021/22                                  | 6909        | 16625           | 104                     | 23638                            | 1.0% | 25           | 23613                            |
| 2022/23                                  | 6958        | 16818           | 105                     | 23880                            | 1.0% | 26           | 23854                            |
| 2023/24                                  | 7007        | 17011           | 106                     | 24124                            | 1.0% | 27           | 24097                            |



Table 3

| NET FIRM ENERGY<br><u>2002/03 - 2023/24 (GW.h)</u><br>(Base Forecast)                                                     |              |              |       |                             |                    |          |                 |                 |
|---------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-------|-----------------------------|--------------------|----------|-----------------|-----------------|
| Fiscal Year                                                                                                               | Dist. Losses | Const. Power | MLCB  | Trans. Losses & Stn Service | Gross Total Energy | Non Firm | Station Service | Net Firm Energy |
| 2002/03 Actual                                                                                                            | 671          | 46           | 19953 | 2182                        | 22135              | 24       | 170             | 21940           |
| 2003/04                                                                                                                   | 830          | 45           | 20241 | 2138                        | 22379              | 35       | 173             | 22171           |
| 2004/05                                                                                                                   | 852          | 45           | 20715 | 2187                        | 22902              | 35       | 177             | 22690           |
| 2005/06                                                                                                                   | 862          | 45           | 20944 | 2211                        | 23156              | 0        | 179             | 22976           |
| 2006/07                                                                                                                   | 872          | 55           | 21205 | 2238                        | 23443              | 0        | 181             | 23262           |
| 2007/08                                                                                                                   | 882          | 85           | 21471 | 2266                        | 23738              | 0        | 184             | 23554           |
| 2008/09                                                                                                                   | 890          | 85           | 21680 | 2288                        | 23969              | 0        | 186             | 23783           |
| 2009/10                                                                                                                   | 899          | 85           | 21886 | 2311                        | 24197              | 0        | 187             | 24009           |
| 2010/11                                                                                                                   | 907          | 55           | 22063 | 2328                        | 24391              | 0        | 189             | 24203           |
| 2011/12                                                                                                                   | 916          | 45           | 22270 | 2350                        | 24620              | 0        | 191             | 24430           |
| 2012/13                                                                                                                   | 926          | 45           | 22498 | 2375                        | 24872              | 0        | 193             | 24680           |
| 2013/14                                                                                                                   | 935          | 45           | 22723 | 2399                        | 25121              | 0        | 194             | 24927           |
| 2014/15                                                                                                                   | 945          | 45           | 22963 | 2424                        | 25387              | 0        | 196             | 25191           |
| 2015/16                                                                                                                   | 955          | 50           | 23207 | 2449                        | 25657              | 0        | 199             | 25458           |
| 2016/17                                                                                                                   | 965          | 55           | 23454 | 2475                        | 25930              | 0        | 201             | 25729           |
| 2017/18                                                                                                                   | 975          | 60           | 23702 | 2502                        | 26204              | 0        | 203             | 26001           |
| 2018/19                                                                                                                   | 985          | 65           | 23951 | 2528                        | 26479              | 0        | 205             | 26274           |
| 2019/20                                                                                                                   | 995          | 95           | 24226 | 2557                        | 26783              | 0        | 207             | 26576           |
| 2020/21                                                                                                                   | 1005         | 95           | 24474 | 2583                        | 27056              | 0        | 209             | 26847           |
| 2021/22                                                                                                                   | 1015         | 115          | 24743 | 2612                        | 27355              | 0        | 212             | 27143           |
| 2022/23                                                                                                                   | 1026         | 130          | 25010 | 2640                        | 27650              | 0        | 214             | 27436           |
| 2023/24                                                                                                                   | 1036         | 95           | 25228 | 2663                        | 27891              | 0        | 216             | 27675           |
| - See the Glossary of Terms for a definition of Gross Total Energy, Non Firm Energy, Station Service and Net Firm Energy. |              |              |       |                             |                    |          |                 |                 |

## **EXECUTIVE SUMMARY**

### **Recommendation**

It is recommended that the Corporation approve this report as Manitoba Hydro's best estimate of Net Firm Energy and Net Total Peak requirements in Manitoba for the 2003/04 to 2023/24 period.

### **Demand Side Management in the Forecast**

This forecast is based on historical billing data and therefore includes the Demand Side Management (DSM) savings achieved to date because DSM savings are inherently contained within the customers' billing records. The cumulative savings by the end of 2002/03 for all Residential, Commercial, Industrial and Street Lighting DSM programs (excluding the Curtailable Rates Program) is estimated to be 94 MW and 436 GW.h at the customers' meter. Including the reduction to T&D losses, the cumulative savings at generation are estimated to be 104 MW and 488 GW.h.

This forecast contains a reduction for future DSM savings associated with the Basic Customer Information and Service. This DSM level is the minimum amount of DSM services and activity that Manitoba Hydro will provide to customers in the future. All other DSM options are analyzed on an incremental basis to this level. Beyond 2002/03, the incremental savings associated with other DSM options are treated as supply side resources and therefore are not included in this forecast. By 2023/24, the Basic Customer Option is estimated to result in a total of 135 MW and 573 GW.h of savings at the customers' meter. These savings are expected to occur in the Residential sector (93 MW and 402 GW.h) and in the General Service sector (42 MW and 171 GW.h). Adding another 10-14% savings due to reduced T & D losses, the total savings at generation will be 153 MW and 652 GW.h by 2023/24.

### **Summary of Forecast Changes**

The most significant change to the forecasting process resulted from the purchase of Winnipeg Hydro. In previous forecasts, the Winnipeg Hydro load was forecasted at the Common Bus level. This year, the Winnipeg Hydro load is forecasted at the sales level.

Separate, econometric forecasts were prepared for Winnipeg Hydro customers in the Residential Standard, Residential All-Electric and General Service Mass Market classification. The sales forecasts contained in this document represent all Manitoba customers. The results were calculated by adding the Manitoba Hydro and Winnipeg Hydro forecasts together.

In fact, all customers are now Manitoba Hydro customers, but this forecast will refer to customers in the Manitoba Hydro service area and the Winnipeg Hydro service area, which is the basis that the forecast was prepared.

This distinction is necessary because the Winnipeg Hydro lacks sufficient market information, at this time, to prepare a detailed end-use forecast for the Residential sector. Manitoba Hydro has recently issued a Residential Energy Use Survey. The results will be incorporated into next year's forecasting process.

The chart below shows the change from the previous forecast for the five, ten and twenty year intervals into the future. The changes are reported for each sector. The reasons causing the load changes are explained afterwards.

| CHANGE FROM PREVIOUS FORECAST |      |             |         |         |
|-------------------------------|------|-------------|---------|---------|
| Sector                        |      | Fiscal Year |         |         |
|                               |      | 2007/08     | 2012/13 | 2022/23 |
| Residential                   | GW.h | 170         | 191     | 240     |
| General Service               | GW.h | 564         | 333     | 456     |
| Area & Roadway Lighting       | GW.h | 22          | 23      | 24      |
| Diesel                        | GW.h | 3           | 5       | 9       |
| Distribution Losses           | GW.h | 70          | 57      | 57      |
| Construction Power            | GW.h | 43          | (3)     | 88      |
| Transmission Losses           | GW.h | 167         | 145     | 181     |
| Net Firm Energy               | GW.h | 1039        | 752     | 1055    |
| Net Total Peak                | MW   | 181         | 132     | 179     |

**Residential** - The Residential forecast was increased as a result of higher average use predictions for Standard and All-Electric customers which reflect the large increase experienced over the last three years.

**General Service** - The General Service forecast was increased to reflect higher energy consumption expectations in the Chemical and Petroleum/Oil/Natural Gas sectors. The General Service Mass Market and General Service Top Consumers categories were revised to include the significant growth experienced over the 2002/03 fiscal year.

**Area and Roadway Lighting** - This category increased due to the inclusion of street lights in the Winnipeg Hydro service area.

**Distribution Losses** - The distribution loss percentage was lowered from 4.7% of Manitoba Hydro sales to 4.3% of all Manitoba Hydro and Winnipeg Hydro sales. The distribution loss forecast increased as a result because losses from the Winnipeg Hydro system are now being included in this category.

**Construction Power** - The Construction Power forecast was changed to reflect the updated in-service dates for the Wuskwatim and Gull generating stations.

**Transmission Losses** - The transmission loss percentage was raised from 9.3% to 9.7%, which reflects the level of transmission losses experienced over the last six years.

**Net Firm Energy** - All of the sectors listed before this category will influence Net Firm Energy. The increase is mainly due to higher expected loads in the Residential, General Service and Transmission Losses classifications.

**Net Total Peak** - The Net Total Peak increased as a result of higher growth levels for Net Firm Energy and because the initial starting point is much higher, reflecting the significant peak load growth experienced in the last two fiscal years. This growth is reflected in the parameters of the Hourly Load Model.

Table 4

| NET FIRM ENERGY AND NET TOTAL PEAK<br>CHANGE FROM PREVIOUS FORECAST                 |                                            |                                            |                      |                                          |                                          |                    |
|-------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------|----------------------|------------------------------------------|------------------------------------------|--------------------|
| Fiscal Year                                                                         | NET FIRM ENERGY                            |                                            |                      | NET TOTAL PEAK                           |                                          |                    |
|                                                                                     | Forecast<br>Prepared<br>May 2003<br>(GW.h) | Forecast<br>Prepared<br>May 2002<br>(GW.h) | Difference<br>(GW.h) | Forecast<br>Prepared<br>May 2003<br>(MW) | Forecast<br>Prepared<br>May 2002<br>(MW) | Difference<br>(MW) |
| 2003/04                                                                             | 22171                                      | 21504                                      | 667                  | 3956                                     | 3828                                     | 128                |
| 2004/05                                                                             | 22690                                      | 21708                                      | 982                  | 4028                                     | 3850                                     | 178                |
| 2005/06                                                                             | 22976                                      | 21975                                      | 1001                 | 4053                                     | 3882                                     | 171                |
| 2006/07                                                                             | 23262                                      | 22251                                      | 1011                 | 4088                                     | 3914                                     | 174                |
| 2007/08                                                                             | 23554                                      | 22515                                      | 1039                 | 4126                                     | 3945                                     | 181                |
| 2008/09                                                                             | 23783                                      | 22774                                      | 1009                 | 4153                                     | 3975                                     | 178                |
| 2009/10                                                                             | 24009                                      | 23031                                      | 978                  | 4180                                     | 4005                                     | 175                |
| 2010/11                                                                             | 24203                                      | 23322                                      | 881                  | 4201                                     | 4041                                     | 160                |
| 2011/12                                                                             | 24430                                      | 23630                                      | 800                  | 4228                                     | 4080                                     | 148                |
| 2012/13                                                                             | 24680                                      | 23928                                      | 752                  | 4258                                     | 4126                                     | 132                |
| 2013/14                                                                             | 24927                                      | 24215                                      | 712                  | 4296                                     | 4170                                     | 126                |
| 2014/15                                                                             | 25191                                      | 24464                                      | 727                  | 4338                                     | 4210                                     | 128                |
| 2015/16                                                                             | 25458                                      | 24705                                      | 753                  | 4380                                     | 4248                                     | 132                |
| 2016/17                                                                             | 25729                                      | 24985                                      | 744                  | 4422                                     | 4293                                     | 129                |
| 2017/18                                                                             | 26001                                      | 25255                                      | 746                  | 4465                                     | 4336                                     | 129                |
| 2018/19                                                                             | 26274                                      | 25517                                      | 757                  | 4508                                     | 4378                                     | 130                |
| 2019/20                                                                             | 26576                                      | 25776                                      | 800                  | 4556                                     | 4419                                     | 137                |
| 2020/21                                                                             | 26847                                      | 25949                                      | 898                  | 4599                                     | 4446                                     | 153                |
| 2021/22                                                                             | 27143                                      | 26158                                      | 985                  | 4646                                     | 4478                                     | 168                |
| 2022/23                                                                             | 27436                                      | 26381                                      | 1055                 | 4692                                     | 4513                                     | 179                |
| - See the Glossary of Terms for a definition of Net Firm Energy and Net Total Peak. |                                            |                                            |                      |                                          |                                          |                    |

## METHODOLOGY

The Base Forecast, Medium-Low and Medium-High scenarios were prepared to analyze the sensitivity towards changes in economic and demographic assumptions. These forecasts were prepared using a combination of forecasting techniques. Detailed explanations of the forecast models are contained in the Residential, General Service and Net Total Peak sections of this report. A brief summary of the methods used is described below:

**Residential** - Econometric and end-use analysis were performed and equations were developed to explain the relationship of Residential electricity consumption to various economic and demographic factors. The Residential Forecast for the Manitoba Hydro service area is calculated using a detailed multi-step, end-use approach. Econometrics are used to forecast the total number of Residential customers and to separate the customers into Standard (non-electric primary space heat) and All-Electric (electric primary space heat) categories. The 1998 Residential Survey provided an update for appliance saturation rates. This information was combined with previous survey results to prepare a forecast of future appliance saturation rates. Conditional Demand Analysis was performed on the appliance survey data to update unit energy consumption (UEC) for each appliance type. Energy Management staff provided estimates for appliance lifetimes and for future unit energy consumption of each major appliance. The information is used to calculate an energy forecast for each end-use. The Residential forecast for the Winnipeg Hydro service area was calculated using regression analysis of Standard and All-Electric sales by rate class because detailed market sector data was not available.

**General Service** - The energy use requirements of our Top Consumers in the Manitoba Hydro service area were reviewed individually. Regression equations were developed to predict the electricity consumption for the Mass Market of all other General Service customers in the Manitoba Hydro service area. A separate regression analysis was performed for all General Service customers in the Winnipeg Hydro service area. Estimates of the load reduction associated with Commercial lighting standards were then deducted from the regression output. The forecast has been modified to reflect any major customers' plans as well as applications for service from new customers.

**Area and Roadway Lighting** - Trends in the historical average use and number of customers were derived and extrapolated for the sentinel and street lighting classifications. Street Lighting for both service areas were combined for this analysis.

**Net Total Peak** - Annual energy is distributed to all 8 760 hours of the year using the base load, heating slope and cooling slope as calculated by the Hourly Load Model.

## ASSUMPTIONS

Forecast assumptions for energy prices, real economic growth, population and housing are taken from the 2003 Economic Outlook and the 2003 Energy Price Outlook. The following is a general overview of the Electric Load Forecast assumptions:

**Electricity** - The electricity price forecast is based on CPI and rate increase projections contained in the Integrated Financial Forecast. After ten years the CPI is forecast to increase 2.0% per year and the electricity price increases are assumed to be 1.0% per year. The real price of electricity is forecast to decrease 12% throughout the forecast period.

**Natural Gas** - The real price of natural gas is expected to drop 12% over the next three years of the forecast. Natural gas prices are expected to return to normal levels and continue to dominate the space heating market.

**Oil** - This forecast assumes that new customers in no-gas available areas will choose to install an electric heating system rather than an oil heating system. The real price of oil is expected to decrease 5% throughout the forecast period. In 2002/03, electricity had a 50% price advantage over oil and is expected to maintain a significant price advantage throughout the forecast period.

**Economic Activity** - The forecast for real economic growth in Manitoba is 3.1% in 2003/04, 2.9% in 2004/05, 2.4% in 2005/06, 2.0% in 2006/07 and decreases slightly each year until reaching 1.4% by 2023/24. The real economic growth rate averages 1.8% throughout the forecast period.

**Population** - The population of Manitoba is forecast to increase by 2 847 per year, compared to a historical average increase of 3 733 per year over the last ten years.

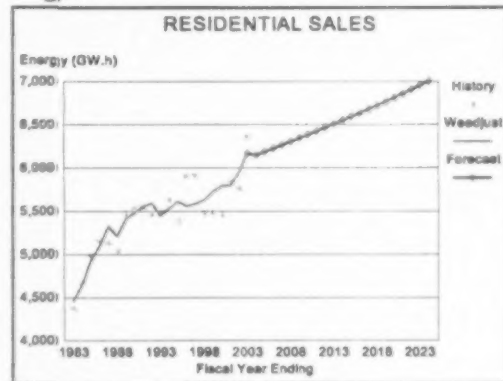
**Housing** - The number of homes in Manitoba area is forecast to increase 1 544 per year, compared to a historical average of 2 407 homes per year over the last decade.



## RESIDENTIAL

The Residential sector represents 33.0% of all sales within Manitoba. It includes electricity sales to individually-metered Residential and Farm customers for non-business operations. The Residential sector is comprised of four forecast groups - Basic, Seasonal, Water Heating and Diesel. The last three groups represent only 1.5% of all Residential sales. These groups are forecasted separately because they have unique rates, distinct usage patterns or different billing periods. The adjacent graph shows that the load grew rapidly in the 80's due to conversions of oil to electric space heating systems.

Figure 1



The Residential sector is forecast to increase from a weather-adjusted base of 6 171 GW.h in 2002/03 to 7 007 GW.h by 2023/24. This represents an average growth of 40 GW.h per year, which is much lower than the ten year annual growth rate of 72 GW.h. The lower annual growth is primarily due to less housing starts and lower space heating requirements for new all-electric homes.

| RESIDENTIAL<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |       |            |                |             |                |
|-------------------------------------------------------|-------|------------|----------------|-------------|----------------|
| Fiscal Year                                           | Sales | Adjustment | Adjusted Sales | Fiscal Year | Forecast Sales |
| 1982/83                                               | 4369  | 91         | 4460           | 2003/04     | 6148           |
| 1983/84                                               | 4666  | -18        | 4648           | 2004/05     | 6191           |
| 1984/85                                               | 4975  | -51        | 4924           | 2005/06     | 6229           |
| 1985/86                                               | 5152  | -54        | 5098           | 2006/07     | 6268           |
| 1986/87                                               | 5138  | 188        | 5326           | 2007/08     | 6309           |
| 1987/88                                               | 5037  | 172        | 5209           | 2008/09     | 6348           |
| 1988/89                                               | 5455  | -45        | 5410           | 2009/10     | 6388           |
| 1989/90                                               | 5543  | -61        | 5482           | 2010/11     | 6428           |
| 1990/91                                               | 5545  | 9          | 5554           | 2011/12     | 6469           |
| 1991/92                                               | 5458  | 134        | 5592           | 2012/13     | 6510           |
| 1992/93                                               | 5489  | -42        | 5447           | 2013/14     | 6552           |
| 1993/94                                               | 5632  | -96        | 5536           | 2014/15     | 6596           |
| 1994/95                                               | 5388  | 225        | 5613           | 2015/16     | 6637           |
| 1995/96                                               | 5907  | -348       | 5559           | 2016/17     | 6680           |
| 1996/97                                               | 5910  | -323       | 5587           | 2017/18     | 6724           |
| 1997/98                                               | 5473  | 156        | 5629           | 2018/19     | 6768           |
| 1998/99                                               | 5482  | 243        | 5725           | 2019/20     | 6814           |
| 1999/00                                               | 5455  | 339        | 5794           | 2020/21     | 6861           |
| 2000/01                                               | 5830  | -33        | 5797           | 2021/22     | 6909           |
| 2001/02                                               | 5765  | 180        | 5945           | 2022/23     | 6958           |
| 2002/03                                               | 6361  | -190       | 6171           | 2023/24     | 7007           |



## RESIDENTIAL BASIC METHODOLOGY

The forecast for Residential Basic customers was prepared separately for the Manitoba Hydro and Winnipeg Hydro service areas. A detailed multi-step, end-use approach was used to forecast the Manitoba Hydro service area. Regression analysis of Standard and All-Electric sales by rate class was used to forecast the Winnipeg Hydro service area. A detailed multi-step, end-use approach could not be used for these customers because survey data was unavailable for this market at the time of forecast preparation.

The Basic category represents 98.5% of the total Residential sales. This category is separated in two distinct groups - Basic Standard and Basic All-Electric. The Standard classification includes all Residential customers that are incapable of heating the premises with electricity. The All-Electric classification includes all Residential customers that are capable of heating the premises with electricity. This distinction is very important because the average Standard customer uses around 10,000 kW.h per year and the average All-Electric customer uses around 26,500 kW.h per year. Electric space heating is the dominant end-use in the Residential sector.

### MANITOBA HYDRO SERVICE AREA

**Residential Basic Customer Forecast** - The Residential Basic category is forecast to increase 1 863 customers per year compared to the ten year annual of 2 724 customers. The number of housing starts is expected to be lower due to lower population growth rates and an aging population.

Standard and All-Electric customer data (1989-2002) is collected from the Customer Information Data Base (CIDB) by combination of town and zone. There are 649 town and zone combinations in Manitoba. The Residential Basic Customer Forecast is then allocated into these areas based on historical growth patterns. The area of the province in which a new home is built is a determining factor as to whether the house will use electric space heat. Homes built in natural gas available areas tend to use natural gas space as their space heating fuel; whereas homes built in areas where natural gas is not available tend to use electricity as their primary space heating fuel. This information is input to the Market Share Model.

**Market Share Model** - This model predicts the proportion of customers that will install electric heat in each of the forecast areas. This proportion is called the market share of electricity (MSE). It is calculated by dividing the number of All-Electric Basic customers by the number of total (Standard and All-Electric) Basic customers. This model employs an econometric equation that predicts the future MSE in each area based on the previous market share and the relative prices of oil and natural gas compared to electricity. Our analysis incorporates a dynamic logit model which assumes that the market shares will grow in the shape of an "S" or saturation curve. Our model produces the following results (with t statistics shown above):

$$LOGIT = \frac{(205.5)}{(.942 \times LOGIT1)} + \frac{(12.9)}{(.075 \times Price)} - \frac{(-6.8)}{.05416}$$

$$R^2 = 98.8\% \quad DF = 8306$$

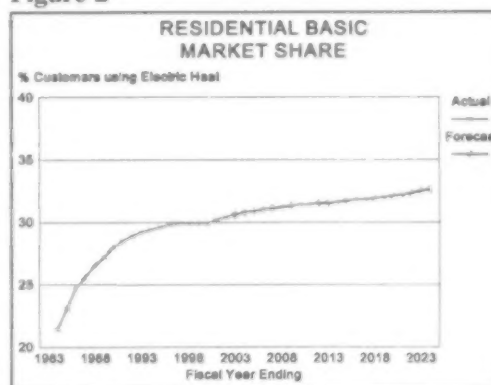
LOGIT - Logit of the market share of electricity (MSE)

LOGIT1 - Logit of the market share of electricity for the previous year

Price - Relative price of natural gas compared to electricity if natural gas is available or  
Relative price of oil compared to electricity if natural gas is not available

The adjacent graph shows that the MSE grew rapidly in the 1980's due to the Canadian Oil Substitution Program (COSP), the instability of oil and natural gas prices, the perception of fossil fuel shortages and the expectation of high price increases. The saturation of electric space heating is expected to increase slightly as natural gas prices return to more normal historic levels. There is a slight increase in the saturation of electric space heat in the last ten years because real electricity prices are forecast to decline 1 % per year.

**Figure 2**



The Market Share Model is used to separate the Residential Basic Customer Forecast into Standard and All-Electric customer groups. All-Electric customers are calculated by multiplying the number of customers by the MSE. Standard customers are calculated by multiplying by (1-MSE).

**Residential End Use Model** - This model uses the Standard and All-Electric customer forecasts from the Market Share Model and incorporates appliance end-use assumptions. The appliance end-use assumptions include an appliance saturation forecast, current appliance usage information, appliance age distributions and appliance efficiency improvement information. This information is combined into a spreadsheet to prepare the Residential End Use Forecast.

**a) Appliance Saturations** - Historical appliance saturation data was collected from previous Manitoba Hydro Residential Surveys. Appliance saturations were forecast using a combination of historical appliance saturation information and professional judgement.

**b) Appliance Usage** - The current estimates of appliance usage or unit energy consumption (UEC) were calculated using 1998 Residential Survey information and Conditional Demand Analysis techniques. The survey results were screened for consumption records and survey completeness. Missing values for the size of home, people per household and income questions were imputed. Degree days heating/cooling and demographic factors such as income, people per household and size of household were added to help explain usage variations. The forecast specifies over thirty end-uses, including details of space heating by building type.

**c) Efficiency Improvements** - New appliances are much more efficient than existing appliance stock. The average use per appliance will decline due to the amount of efficiency improvement and the rate that older, inefficient stock is replaced. The future consumption levels of each end-use were analyzed and forecasted independently based on literature, contact with other utilities and professional judgment. Some end-uses such as fridges and freezers were forecasted to become significantly more efficient. The number of replacement appliances were calculated using a modified Weibull distribution with estimated appliance lifetimes.

The Residential Basic End Use Forecast is divided into Basic Standard and Basic All-Electric groups. The electric space heating end-uses are added to the All-Electric classification. The other end-uses are proportioned into the Standard and All-Electric classifications.

## WINNIPEG HYDRO SERVICE AREA

Energy forecasts for both the Standard and All-Electric sectors were developed by modelling historical, weather-adjusted GW.h as a function of the previous years weather-adjusted GW.h and gross domestic product using log-log models. The model results for the Standard sector were as follows (with t-statistics shown above):

$$LNGW = \begin{matrix} (7.25) \\ (.814 \times LNGW1) \end{matrix} + \begin{matrix} (1.70) \\ (.084 \times LGDP) \end{matrix} + \begin{matrix} (0.5) \\ 0.28288 \end{matrix}$$

$$R^2 = 82.1\% \quad DF = 21$$

LNGW - Log of the weather-adjusted GW.h  
 LNGW1 - Log of the weather-adjusted GW.h for the previous year  
 LGDP - Log of the Gross Domestic Product

The results for the All-Electric sector were as follows (with t-statistics shown above):

$$LNGW = \frac{(15.58)}{(.870 \times LNGW1)} + \frac{(0.01)}{(.0008 \times LGDP)} + \frac{(0.6)}{+ 0.59118}$$

$$R^2 = 96.9\% \quad DF = 21$$

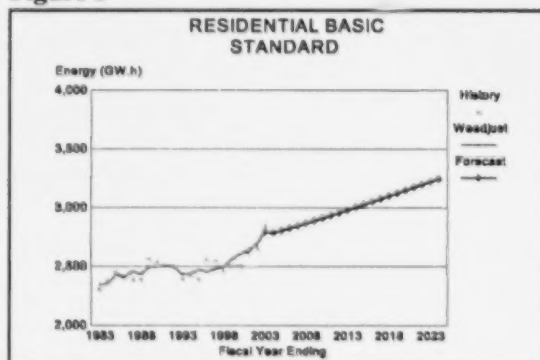
- LNGW - Log of the weather-adjusted GW.h
- LNGW1 - Log of the weather-adjusted GW.h for the previous year
- LGDP - Log of the Gross Domestic Product

### COMBINED SERVICE AREA

The Residential Standard and All-Electric forecasts for the Manitoba Hydro and Winnipeg Hydro service areas were combined to produce the following results:

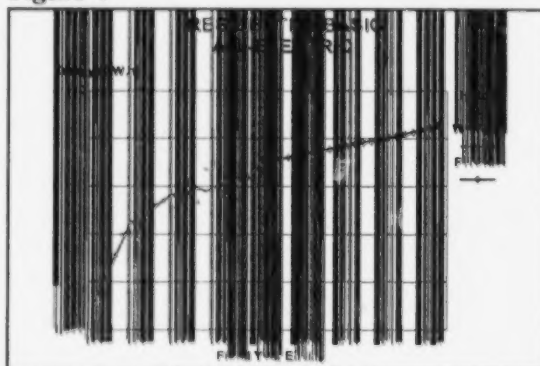
The Residential Basic Standard energy use remained quite constant during the 80's because many rural oil heated customers switched to electric space heat. The effect of appliance efficiency standards limited load growth in the early 90's. This sector has grown in the last five years. The forecast contains limited growth in the next few years as customers react to relatively high natural gas prices. The forecast assumes that most new homes will install electric water heaters.

Figure 3



The Residential Basic All-Electric energy grew rapidly in the 1980's as rural customers switched from oil to electric space heating. This sector continued to grow because most new homes in rural areas installed electric water and space heat. Many of the new, all-electric homes are being built in First Nations communities that do not have access to natural gas. This category will continue to grow due to new housing construction in rural areas.

Figure 4



### RESIDENTIAL - OTHER

This category includes the three Residential groups that represent only 1.5% of all Residential sales. These groups are forecasted separately because they have unique rates, distinct usage patterns or different billing periods. These groups have a very minor effect on the overall load forecast and are not discussed in detail in this report. These groups are forecasted using trend analysis and extrapolation techniques.

### **Seasonal**

There were 13 171 Residential Seasonal Standard customers by the end of the 2002/03 fiscal year. The number of customers is expected to decrease 1% per year throughout the forecast period. Average use was 2 111 kW.h per customer in 2002/03 and is forecast to be 2 200 kW.h per customer in 2003/04 and grow 50 kW.h per year. There were 7 059 Residential Seasonal All-Electric customers by the end of the 2002/03 fiscal year. The number of customers is forecast to be 7 400 in 2003/04 and increase 300 per year throughout the forecast period. Average use was 3 658 kW.h per customer in 2002/03 and is forecast to be 3 700 kW.h per customer in 2003/04 and grow 50 kW.h per year.

### **Water Heating**

Residential Water Heating is a flat rate unmetered service. This service has not been available to new customers since November 12, 1969. There were 6 878 remaining customers in 2002/03. The ten year trend is an annual decrease of 4.9% in the number of customers. The number of customers is expected to decrease 5% per year throughout the forecast period. Average use was 5 121 kW.h per customer in 2002/03 and is forecasted to be 5 120 kW.h per customer.

### **Diesel**

This group includes the remaining diesel sites in Manitoba - Brochet, Lac Brochet, Tadoule Lake and Shamattawa. These sites consumed 6 GW.h in 2002/03. Consumption is expected to increase to 14 GW.h by 2023/24. Consumption at these sites is expected to grow because the service limitations have been upgraded from 15 amps to 60 amps.

Table 5

| TOTAL RESIDENTIAL SALES |            |             |               |           |                        |       |
|-------------------------|------------|-------------|---------------|-----------|------------------------|-------|
| Fiscal Year             | Basic GW.h | Diesel GW.h | Seasonal GW.h | FRWH GW.h | Total Residential GW.h | %     |
| 1991/92                 | 5280       | 11          | 51            | 116       | 5458                   | 12.0% |
| 1992/93                 | 5317       | 12          | 52            | 108       | 5489                   | 0.6%  |
| 1993/94                 | 5467       | 13          | 51            | 103       | 5632                   | 2.6%  |
| 1994/95                 | 5230       | 13          | 47            | 97        | 5388                   | -4.3% |
| 1995/96                 | 5753       | 15          | 48            | 92        | 5907                   | 9.6%  |
| 1996/97                 | 5797       | 16          | 48            | 49        | 5910                   | 0.1%  |
| 1997/98                 | 5370       | 13          | 46            | 45        | 5473                   | -7.4% |
| 1998/99                 | 5384       | 11          | 44            | 43        | 5482                   | 0.2%  |
| 1999/00                 | 5364       | 5           | 46            | 40        | 5455                   | -0.5% |
| 2000/01                 | 5737       | 5           | 49            | 39        | 5830                   | 6.9%  |
| 2001/02                 | 5674       | 6           | 49            | 37        | 5765                   | -1.1% |
| 2002/03                 | 6266       | 6           | 54            | 35        | 6361                   | 10.3% |
| 2003/04                 | 6053       | 6           | 56            | 33        | 6148                   | -3.3% |
| 2004/05                 | 6094       | 7           | 58            | 32        | 6191                   | 0.7%  |
| 2005/06                 | 6132       | 7           | 60            | 30        | 6229                   | 0.6%  |
| 2006/07                 | 6170       | 8           | 62            | 29        | 6268                   | 0.6%  |
| 2007/08                 | 6210       | 8           | 64            | 27        | 6309                   | 0.7%  |
| 2008/09                 | 6248       | 9           | 66            | 26        | 6348                   | 0.6%  |
| 2009/10                 | 6287       | 9           | 67            | 25        | 6388                   | 0.6%  |
| 2010/11                 | 6326       | 10          | 69            | 23        | 6428                   | 0.6%  |
| 2011/12                 | 6365       | 10          | 71            | 22        | 6469                   | 0.6%  |
| 2012/13                 | 6405       | 10          | 73            | 21        | 6510                   | 0.6%  |
| 2013/14                 | 6445       | 11          | 76            | 20        | 6552                   | 0.6%  |
| 2014/15                 | 6488       | 11          | 78            | 19        | 6596                   | 0.7%  |
| 2015/16                 | 6528       | 12          | 80            | 18        | 6637                   | 0.6%  |
| 2016/17                 | 6569       | 12          | 82            | 17        | 6680                   | 0.6%  |
| 2017/18                 | 6611       | 12          | 84            | 16        | 6724                   | 0.7%  |
| 2018/19                 | 6654       | 13          | 86            | 16        | 6768                   | 0.7%  |
| 2019/20                 | 6698       | 13          | 88            | 15        | 6814                   | 0.7%  |
| 2020/21                 | 6743       | 13          | 90            | 14        | 6861                   | 0.7%  |
| 2021/22                 | 6789       | 14          | 93            | 13        | 6909                   | 0.7%  |
| 2022/23                 | 6836       | 14          | 95            | 13        | 6958                   | 0.7%  |
| 2023/24                 | 6884       | 14          | 97            | 12        | 7007                   | 0.7%  |



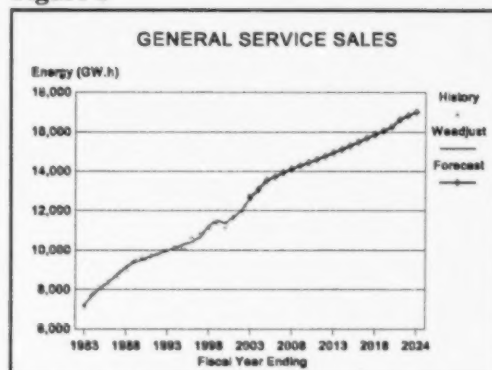
Table 6

| RESIDENTIAL BASIC SALES |                |      |       |                    |      |       |             |      |       |        |
|-------------------------|----------------|------|-------|--------------------|------|-------|-------------|------|-------|--------|
| Fiscal Year             | Basic Standard |      |       | Basic All-Electric |      |       | Total Basic |      |       | MSE    |
|                         | Mtrs.          | GW.h | Avg.  | Mtrs.              | GW.h | Avg.  | Mtrs.       | GW.h | Avg.  |        |
| 1991/92                 | 279478         | 2490 | 8909  | 113436             | 2790 | 24595 | 392914      | 5280 | 13438 | 28.87% |
| 1992/93                 | 279767         | 2398 | 8571  | 115272             | 2918 | 25314 | 395039      | 5316 | 13457 | 29.18% |
| 1993/94                 | 280620         | 2428 | 8652  | 117071             | 3039 | 25959 | 397691      | 5467 | 13747 | 29.44% |
| 1994/95                 | 281511         | 2392 | 8497  | 118470             | 2838 | 23955 | 399981      | 5230 | 13076 | 29.62% |
| 1995/96                 | 282141         | 2565 | 9091  | 119789             | 3188 | 26613 | 401930      | 5753 | 14313 | 29.80% |
| 1996/97                 | 283461         | 2556 | 9017  | 120894             | 3241 | 26809 | 404355      | 5797 | 14336 | 29.90% |
| 1997/98                 | 285900         | 2456 | 8590  | 121658             | 2914 | 23952 | 407558      | 5370 | 13176 | 29.85% |
| 1998/99                 | 286626         | 2502 | 8729  | 122126             | 2882 | 23599 | 408752      | 5384 | 13172 | 29.88% |
| 1999/00                 | 288850         | 2501 | 8658  | 123156             | 2863 | 23247 | 412006      | 5364 | 13019 | 29.89% |
| 2000/01                 | 289796         | 2621 | 9044  | 125096             | 3117 | 24917 | 414892      | 5738 | 13830 | 30.15% |
| 2001/02                 | 290255         | 2659 | 9161  | 126515             | 3015 | 23831 | 416770      | 5674 | 13614 | 30.36% |
| 2002/03                 | 290830         | 2848 | 9793  | 128280             | 3418 | 26645 | 419110      | 6266 | 14951 | 30.61% |
| 2003/04                 | 291413         | 2788 | 9567  | 129756             | 3265 | 25163 | 421169      | 6053 | 14372 | 30.81% |
| 2004/05                 | 292035         | 2807 | 9612  | 130833             | 3287 | 25124 | 422868      | 6094 | 14411 | 30.94% |
| 2005/06                 | 292650         | 2827 | 9660  | 131722             | 3305 | 25091 | 424372      | 6132 | 14450 | 31.04% |
| 2006/07                 | 293357         | 2848 | 9708  | 132574             | 3322 | 25058 | 425931      | 6170 | 14486 | 31.13% |
| 2007/08                 | 294127         | 2870 | 9758  | 133437             | 3340 | 25031 | 427564      | 6210 | 14524 | 31.21% |
| 2008/09                 | 294878         | 2891 | 9804  | 134243             | 3357 | 25007 | 429121      | 6248 | 14560 | 31.28% |
| 2009/10                 | 295638         | 2914 | 9857  | 135024             | 3373 | 24981 | 430662      | 6287 | 14598 | 31.35% |
| 2010/11                 | 296407         | 2936 | 9905  | 135785             | 3390 | 24966 | 432192      | 6326 | 14637 | 31.42% |
| 2011/12                 | 297151         | 2959 | 9958  | 136521             | 3406 | 24949 | 433672      | 6365 | 14677 | 31.48% |
| 2012/13                 | 297913         | 2982 | 10010 | 137247             | 3422 | 24933 | 435160      | 6404 | 14716 | 31.54% |
| 2013/14                 | 298679         | 3006 | 10064 | 137984             | 3440 | 24930 | 436663      | 6446 | 14762 | 31.60% |
| 2014/15                 | 299411         | 3030 | 10120 | 138768             | 3459 | 24926 | 438179      | 6489 | 14809 | 31.67% |
| 2015/16                 | 300116         | 3054 | 10176 | 139608             | 3474 | 24884 | 439724      | 6528 | 14846 | 31.75% |
| 2016/17                 | 300792         | 3078 | 10233 | 140485             | 3492 | 24857 | 441277      | 6570 | 14889 | 31.84% |
| 2017/18                 | 301462         | 3102 | 10290 | 141347             | 3509 | 24825 | 442809      | 6611 | 14930 | 31.92% |
| 2018/19                 | 302097         | 3127 | 10351 | 142212             | 3527 | 24801 | 444309      | 6654 | 14976 | 32.01% |
| 2019/20                 | 302655         | 3151 | 10411 | 143124             | 3546 | 24776 | 445779      | 6697 | 15023 | 32.11% |
| 2020/21                 | 303162         | 3176 | 10476 | 144069             | 3567 | 24759 | 447231      | 6743 | 15077 | 32.21% |
| 2021/22                 | 303637         | 3200 | 10539 | 145044             | 3589 | 24744 | 448681      | 6789 | 15131 | 32.33% |
| 2022/23                 | 304075         | 3224 | 10603 | 146043             | 3612 | 24732 | 450118      | 6836 | 15187 | 32.45% |
| 2023/24                 | 304473         | 3248 | 10668 | 147065             | 3636 | 24724 | 451538      | 6884 | 15246 | 32.57% |

## GENERAL SERVICE

The General Service sector represents 66.5% of all sales in Manitoba. It includes sales to all Commercial and Industrial businesses in Manitoba. This sector consists of six forecast groups - Top Consumers, Mass Market, Seasonal, Water Heating, Diesel and Surplus Energy Program (SEP). The last four groups represent only 0.4% of all General Service sales. The adjacent graph shows continuous load growth over the last twenty years, except for a slight downturn in 1999/00.

Figure 5



The General Service sector is forecast to increase from a weather-adjusted base of 12 686 GW.h in 2002/03 to 17 011 GW.h by 2023/24. This represents an average growth of 206 GW.h per year, which is lower than the ten year annual growth rate of 272 GW.h per year. The increase in General Service consumption can be primarily attributed to steady economic performance and low electricity prices. The chemical and oil/petroleum sectors are expected to lead the way.

| GENERAL SERVICE<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |       |            |                |             |                |
|-----------------------------------------------------------|-------|------------|----------------|-------------|----------------|
| Fiscal Year                                               | Sales | Adjustment | Adjusted Sales | Fiscal Year | Forecast Sales |
| 1982/83                                                   | 7132  | 66         | 7198           | 2003/04     | 13075          |
| 1983/84                                                   | 7782  | -46        | 7736           | 2004/05     | 13548          |
| 1984/85                                                   | 8126  | -38        | 8088           | 2005/06     | 13729          |
| 1985/86                                                   | 8395  | -9         | 8386           | 2006/07     | 13931          |
| 1986/87                                                   | 8661  | 113        | 8774           | 2007/08     | 14117          |
| 1987/88                                                   | 9021  | 98         | 9119           | 2008/09     | 14278          |
| 1988/89                                                   | 9458  | -82        | 9376           | 2009/10     | 14435          |
| 1989/90                                                   | 9574  | -70        | 9504           | 2010/11     | 14594          |
| 1990/91                                                   | 9689  | 2          | 9691           | 2011/12     | 14762          |
| 1991/92                                                   | 9772  | 60         | 9832           | 2012/13     | 14939          |
| 1992/93                                                   | 9954  | 8          | 9962           | 2013/14     | 15113          |
| 1993/94                                                   | 10126 | -18        | 10108          | 2014/15     | 15299          |
| 1994/95                                                   | 10120 | 169        | 10289          | 2015/16     | 15487          |
| 1995/96                                                   | 10659 | -242       | 10417          | 2016/17     | 15676          |
| 1996/97                                                   | 10855 | -186       | 10669          | 2017/18     | 15865          |
| 1997/98                                                   | 11121 | 94         | 11215          | 2018/19     | 16054          |
| 1998/99                                                   | 11360 | 139        | 11499          | 2019/20     | 16244          |
| 1999/00                                                   | 11152 | 215        | 11367          | 2020/21     | 16434          |
| 2000/01                                                   | 11673 | 4          | 11677          | 2021/22     | 16625          |
| 2001/02                                                   | 11951 | 89         | 12040          | 2022/23     | 16818          |
| 2002/03                                                   | 12796 | -110       | 12686          | 2023/24     | 17011          |



## GENERAL SERVICE TOP CONSUMERS METHODOLOGY

This category includes the top energy consuming businesses in the Manitoba Hydro service area and represents 41.3% of all electricity consumed in the General Service sector. The Top Consumers group includes: INCO, HBM&S (Flin Flon/Stall), Gerdau (MRM), HBM&S (Ruttan), Griffin Canada, TVX Gold, Nexen Chemicals, Simplot, TransCanada Power (TCP), Enbridge, Tembec (Pine Falls Paper), Tolko, Louisiana Pacific, University of Manitoba, Maple Leaf (Brandon), Midwest Foods, McCain Foods, Albchem, and Simplot Potato. The Top Consumers category includes all future energy requirements for the above mentioned customers. Some customers are planning major expansions, some customers are expected to remain at current operating levels and some customers are planning to reduce their levels of consumption in the future.

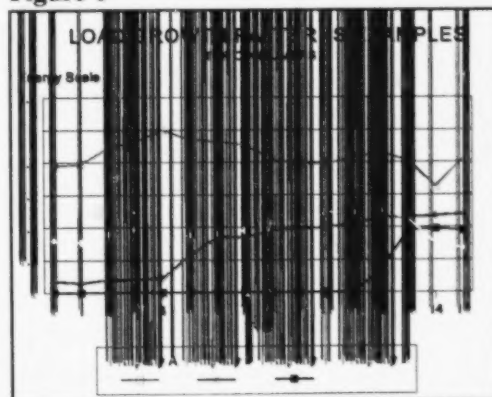
This category must also contain some speculative load growth because new, large Industrial customers will be energized to the Manitoba system in the future. Therefore, starting in 2007/08, we have created a classification called Potential Large Industrial Loads. This classification is used to represent the load requirements of potential Industrial loads that will be energized throughout the forecast period, but at this time, these loads are unspecified. Since 1980/81, seven new Industrial loads have been energized in Manitoba - HBM&S at Flin Flon, TransCanada Power at Iles Des Chenes, Maple Leaf at Brandon, Louisiana Pacific, New Britannia (TVX Gold) mine, Albchem and Simplot Potato. The forecast must contain an allotment for new Industrial customers to set up operations in Manitoba.

Each customer in the Top Consumers group is forecasted individually. Information on individual company operating plans is collected by Manitoba Hydro Key and Major Account representatives. This information is used to prepare company specific forecasts. Information of this nature can be very sensitive and, as such, is treated as confidential and not available for public review.

The Top Consumers must be forecast individually because their loads do not grow in a slow, steady, predictable pattern. Their loads can change abruptly and in distinct stages. If a customer decides to expand operations, the load will increase quickly. Conversely, if a customer decides to down size or cease operations, the load will decrease dramatically. These type of load changes are not conducive to econometric forecasting models and must be examined on an individual basis. The adjacent graph illustrates the example of annual load variation that can occur with large Industrial customers. Company

A had a strike in year fourteen. Company B grew steadily throughout, but had a major expansion in

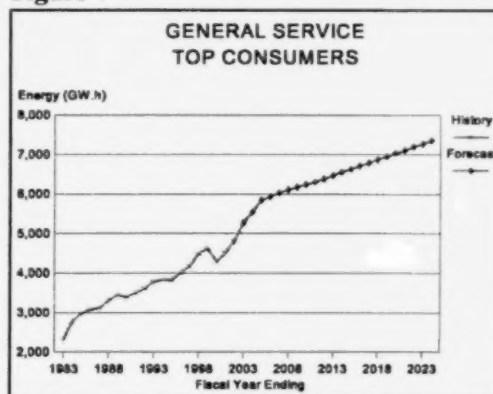
Figure 6



years five and six. Company C started operations in year twelve. Company D increased production in year fourteen, but lowered electricity consumption due to plant efficiency improvements.

The adjacent graph shows that the Top Consumers category has grown consistently over the last two decades, except for a downturn in 1999/00 caused by reduced consumption by INCO, Enbridge and Simplot. Seven new loads (HBM&S at Flin Flon, TransCanada Power, Maple Leaf, Louisiana Pacific, New Britannia, Albchem and Simplot Potato) have been added to the system since 1981. These new customers have added 1 618 GW.h of load over the period, averaging 74 GW.h per year. Expansion at Nexen Chemicals has also contributed to the growth of this sector.

**Figure 7**



The Top Consumer category is forecast to increase from a base of 5 279 GW.h in 2002/03 to 7 355 GW.h by 2023/24. This represents an average growth of 99 GW.h per year, which is lower than the ten year annual growth rate of 150 GW.h per year.

In 2003/04, this group is expected to grow significantly due to increased pumping requirements of Enbridge as Phase III of the Terrance Expansion is completed, increased production at Albchem and the addition of the Simplot Potato manufacturing facility. This growth will be offset slightly as Ruttan ceases operations and Tolko is expected to add self-generation.

The forecast includes some potential for conversion of natural gas pipelines to electric drive motors, further expansion in the chemicals sector and 80 GW.h per year by 2007/08, increasing to 100 GW.h per year by 2013/14 for other Potential Large Industrial loads.

## GENERAL SERVICE MASS MARKET METHODOLOGY

Separate econometric forecasts were prepared for the Manitoba Hydro and Winnipeg Hydro service areas. The results were combined to produce a General Service Mass Market forecast for Manitoba.

### MANITOBA HYDRO SERVICE AREA

This category includes all other Commercial and Industrial businesses located in the Manitoba Hydro service area, excluding the Top Consumers group. This group is forecasted using econometric techniques. The General Service Mass Market econometric model was derived using sales data over the 1989-2002 period and produced the following results (with t-statistics shown above):

$$LGSNG = \begin{matrix} (0.5) \\ (.106 \times LGSNG1) \end{matrix} + \begin{matrix} (-0.7) \\ (-.187 \times LRPE1) \end{matrix} + \begin{matrix} (3.7) \\ (.746 \times LGDP) \end{matrix} + \begin{matrix} (0.1) \\ + 0.18388 \end{matrix}$$

$$R^2 = 99.2\% \quad DF = 7$$

LGSNG - Log of the weather-adjusted General Service Mass Market sales

LGSNG1 - Log of the weather-adjusted General Service Mass Market sales for the previous year

LRPE1 - Log of the real price of electricity for the previous year

LGDP - Log of the real gross domestic product

The Mass Market forecast is finalized by reducing the econometric results by the amount of expected savings from Commercial and Industrial DSM programs. The forecast is then allocated to the Small Non-Demand, Small Demand, Medium and Large rate classes based on historical growth proportions.

### WINNIPEG HYDRO SERVICE AREA

The Energy forecast for the Winnipeg Hydro General Service Mass Market was developed by modelling historical weather-adjusted GW.h as a function of the previous years weather-adjusted GW.h and gross domestic product. The model results were derived over the 1988-2003 period and produced which follow (with t-statistics shown above):

$$LNGW = \begin{matrix} (2.70) \\ (.528 \times LNGW1) \end{matrix} + \begin{matrix} (1.65) \\ (.128 \times LGDP) \end{matrix} + \begin{matrix} (2.5) \\ + 2.211 \end{matrix}$$

$$R^2 = 82.8\% \quad DF = 13$$

LNGW - Log of the weather-adjusted GW.h

- LNGW1 - Log of the weather-adjusted GW.h for the previous year
- LGDP - Log of the Gross Domestic Product

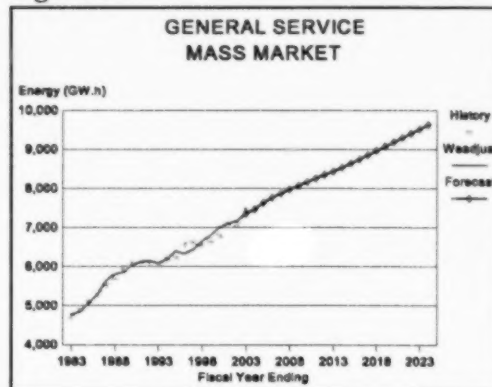
The Mass Market forecast is finalized by reducing the econometric results by the amount of expected savings from Commercial and Industrial DSM programs. The forecast is then allocated to the Small Non-Demand, Small Demand, Medium and Large rate classes based on historical growth proportions.

## COMBINED SERVICE AREA

The General Service Mass Market forecasts for the Manitoba Hydro and Winnipeg Hydro service areas were combined to produce a General Service Mass Market forecast for Manitoba, resulting in the following:

The Mass Market load has grown steadily throughout the last two decades, except for brief periods of inactivity during the economic downturn of the early 1990's. This load is resilient and does not decrease dramatically due to economic fluctuations, plant closures and strikes. Many of the larger businesses in this group are schools, hospitals, grocery stores, hotels, large offices and government buildings that provide necessary services. These businesses are fairly stable, electricity consumption is not as dependent on volatile market conditions.

**Figure 8**



The Mass Market category is forecast to increase from 7 469 GW.h in 2002/03 to 9 636 GW.h by 2023/24. This represents an average growth of 103 GW.h per year, which is lower than the ten year annual growth rate of 139 GW.h per year. The Mass Market growth is based on expectations of steady economic growth, constant real electricity prices in the first ten years of the forecast and declining real electricity prices in the second ten years of the forecast.

## **GENERAL SERVICE - OTHER**

This category includes the four General Service groups that represent only 0.4% of all General Service sales. These groups have unique rate codes and are forecasted separately for rate and billing purposes. These groups have a very minor effect on the overall load forecast and therefore will not be discussed in detail in this report. These groups are forecasted using trend analysis and extrapolation techniques.

### **Seasonal**

There were 783 General Service Seasonal customers by the end of the 2002/03 fiscal year. The five year trend is an annual decrease of 2% in the number of customers per year. The number of customers is expected to be 767 in 2003/04 and decline 2 % year. Average use was 5 534 kW.h per customer in 2002/03 and is forecast to remain constant at 5 550 kW.h per customer throughout the forecast period.

### **Water Heating**

General Service Water Heating is a flat rate unmetered service that has not been available since November 12, 1969. There were 633 remaining customers by the end of the 2002/03 fiscal year. The five year trend is an annual decrease of 4.2% in the number of customers. The number of customers is expected to decrease 5% per year throughout the forecast period. Average use was 21 730 kW.h per customer in 2002/03 and is forecast to be 21 700 kW.h per customer throughout the forecast period.

### **Diesel**

The Diesel Full Cost classification consumed 4 GW.h in 2002/03. Consumption is expected to increase to 12 GW.h by 2023/24.

### **Surplus Energy Program**

Participants in the Surplus Energy Program (SEP) are expected to consume 35 GW.h per year during the 2003/04 to 2004/05 period and then the program will be discontinued or altered in some fashion.

Table 7

| TOTAL GENERAL SERVICE SALES |                    |                      |               |                 |             |                |                              |       |
|-----------------------------|--------------------|----------------------|---------------|-----------------|-------------|----------------|------------------------------|-------|
| Fiscal Year                 | Mass Market (GW.h) | Top Consumers (GW.h) | Diesel (GW.h) | Seasonal (GW.h) | FRWH (GW.h) | SEP/DFH (GW.h) | Total General Service (GW.h) | %     |
| 1991/92                     | 6094               | 3611                 | 11            | 7               | 42          | 6              | 9772                         | 0.9%  |
| 1992/93                     | 6077               | 3783                 | 12            | 7               | 39          | 37             | 9954                         | 1.9%  |
| 1993/94                     | 6210               | 3836                 | 13            | 6               | 35          | 27             | 10126                        | 1.7%  |
| 1994/95                     | 6233               | 3825                 | 14            | 6               | 32          | 10             | 10120                        | -0.1% |
| 1995/96                     | 6573               | 4021                 | 16            | 5               | 30          | 14             | 10659                        | 5.3%  |
| 1996/97                     | 6627               | 4173                 | 17            | 5               | 18          | 15             | 10855                        | 1.8%  |
| 1997/98                     | 6562               | 4493                 | 14            | 5               | 16          | 31             | 11121                        | 2.5%  |
| 1998/99                     | 6668               | 4632                 | 9             | 5               | 15          | 30             | 11360                        | 2.1%  |
| 1999/00                     | 6796               | 4299                 | 4             | 5               | 15          | 33             | 11152                        | -1.8% |
| 2000/01                     | 7110               | 4515                 | 4             | 4               | 15          | 26             | 11673                        | 4.7%  |
| 2001/02                     | 7084               | 4818                 | 5             | 4               | 14          | 24             | 11951                        | 2.4%  |
| 2002/03                     | 7469               | 5279                 | 4             | 4               | 14          | 25             | 12796                        | 7.1%  |
| 2003/04                     | 7472               | 5546                 | 5             | 4               | 13          | 35             | 13075                        | 2.2%  |
| 2004/05                     | 7641               | 5850                 | 5             | 4               | 12          | 35             | 13548                        | 3.6%  |
| 2005/06                     | 7773               | 5935                 | 6             | 4               | 12          | 0              | 13729                        | 1.3%  |
| 2006/07                     | 7880               | 6030                 | 6             | 4               | 11          | 0              | 13931                        | 1.5%  |
| 2007/08                     | 7981               | 6115                 | 6             | 4               | 11          | 0              | 14117                        | 1.3%  |
| 2008/09                     | 8077               | 6180                 | 7             | 4               | 10          | 0              | 14278                        | 1.1%  |
| 2009/10                     | 8170               | 6245                 | 7             | 4               | 10          | 0              | 14435                        | 1.1%  |
| 2010/11                     | 8264               | 6310                 | 8             | 4               | 9           | 0              | 14594                        | 1.1%  |
| 2011/12                     | 8356               | 6385                 | 8             | 4               | 9           | 0              | 14762                        | 1.2%  |
| 2012/13                     | 8444               | 6475                 | 8             | 4               | 8           | 0              | 14939                        | 1.2%  |
| 2013/14                     | 8538               | 6555                 | 9             | 3               | 8           | 0              | 15113                        | 1.2%  |
| 2014/15                     | 8644               | 6635                 | 9             | 3               | 7           | 0              | 15299                        | 1.2%  |
| 2015/16                     | 8752               | 6715                 | 10            | 3               | 7           | 0              | 15487                        | 1.2%  |
| 2016/17                     | 8861               | 6795                 | 10            | 3               | 7           | 0              | 15676                        | 1.2%  |
| 2017/18                     | 8970               | 6875                 | 10            | 3               | 6           | 0              | 15865                        | 1.2%  |
| 2018/19                     | 9079               | 6955                 | 11            | 3               | 6           | 0              | 16054                        | 1.2%  |
| 2019/20                     | 9189               | 7035                 | 11            | 3               | 6           | 0              | 16244                        | 1.2%  |
| 2020/21                     | 9300               | 7115                 | 11            | 3               | 5           | 0              | 16434                        | 1.2%  |
| 2021/22                     | 9410               | 7195                 | 12            | 3               | 5           | 0              | 16625                        | 1.2%  |
| 2022/23                     | 9523               | 7275                 | 12            | 3               | 5           | 0              | 16818                        | 1.2%  |
| 2023/24                     | 9636               | 7355                 | 12            | 3               | 5           | 0              | 17011                        | 1.1%  |



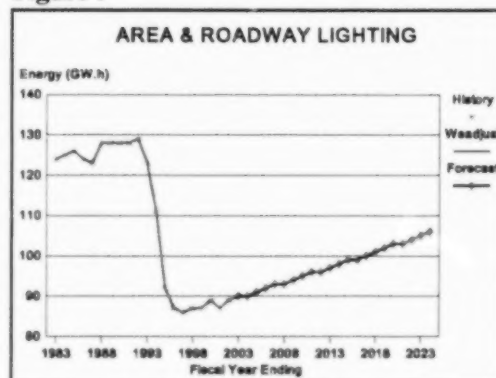
Table 8

| GENERAL SERVICE BASIC SALES |             |      |        |               |      |                |             |       |        |
|-----------------------------|-------------|------|--------|---------------|------|----------------|-------------|-------|--------|
| Fiscal Year                 | Mass Market |      |        | Top Consumers |      |                | Total Basic |       |        |
|                             | Mtrs.       | GW.h | Avg.   | Mtrs.         | GW.h | Avg.<br>(MW.h) | Mtrs.       | GW.h  | Avg.   |
| 1991/92                     | 57339       | 6094 | 106280 | 18            | 3611 | 200611         | 57357       | 9705  | 169203 |
| 1992/93                     | 57543       | 6077 | 105608 | 20            | 3783 | 189150         | 57563       | 9860  | 171291 |
| 1993/94                     | 57713       | 6210 | 107601 | 21            | 3836 | 182667         | 57734       | 10046 | 174005 |
| 1994/95                     | 57954       | 6233 | 107551 | 21            | 3825 | 182143         | 57975       | 10058 | 173489 |
| 1995/96                     | 58194       | 6573 | 112950 | 23            | 4021 | 174826         | 58217       | 10594 | 181974 |
| 1996/97                     | 58134       | 6627 | 113995 | 28            | 4173 | 149036         | 58162       | 10800 | 185688 |
| 1997/98                     | 58717       | 6562 | 111756 | 33            | 4493 | 136152         | 58750       | 11055 | 188170 |
| 1998/99                     | 59214       | 6668 | 112609 | 34            | 4632 | 136235         | 59248       | 11300 | 190724 |
| 1999/00                     | 59612       | 6796 | 114004 | 35            | 4299 | 122829         | 59647       | 11095 | 186011 |
| 2000/01                     | 59938       | 7110 | 118623 | 31            | 4515 | 145645         | 59969       | 11625 | 193850 |
| 2001/02                     | 60184       | 7084 | 117706 | 25            | 4818 | 192720         | 60209       | 11902 | 197678 |
| 2002/03                     | 60470       | 7469 | 123516 | 26            | 5279 | 203038         | 60496       | 12748 | 210725 |
| 2003/04                     | 60817       | 7472 | 122860 | 27            | 5546 | 205407         | 60844       | 13018 | 213957 |
| 2004/05                     | 61164       | 7641 | 124926 | 26            | 5850 | 225000         | 61190       | 13491 | 220477 |
| 2005/06                     | 61512       | 7773 | 126366 | 26            | 5935 | 228269         | 61538       | 13708 | 222757 |
| 2006/07                     | 61860       | 7880 | 127384 | 26            | 6030 | 231923         | 61886       | 13910 | 224768 |
| 2007/08                     | 62208       | 7981 | 128295 | 27            | 6115 | 226481         | 62235       | 14096 | 226496 |
| 2008/09                     | 62557       | 8077 | 129114 | 27            | 6180 | 228889         | 62584       | 14257 | 227806 |
| 2009/10                     | 62906       | 8170 | 129876 | 27            | 6245 | 231296         | 62933       | 14415 | 229053 |
| 2010/11                     | 63255       | 8264 | 130646 | 26            | 6310 | 242692         | 63281       | 14574 | 230306 |
| 2011/12                     | 63604       | 8356 | 131375 | 26            | 6385 | 245577         | 63630       | 14741 | 231667 |
| 2012/13                     | 63954       | 8444 | 132032 | 26            | 6475 | 249038         | 63980       | 14919 | 233182 |
| 2013/14                     | 64304       | 8538 | 132776 | 26            | 6555 | 252115         | 64330       | 15093 | 234618 |
| 2014/15                     | 64654       | 8644 | 133696 | 26            | 6635 | 255192         | 64680       | 15279 | 236224 |
| 2015/16                     | 65005       | 8752 | 134636 | 26            | 6715 | 258269         | 65031       | 15467 | 237840 |
| 2016/17                     | 65356       | 8861 | 135581 | 26            | 6795 | 261346         | 65382       | 15656 | 239454 |
| 2017/18                     | 65707       | 8970 | 136515 | 26            | 6875 | 264423         | 65733       | 15845 | 241051 |
| 2018/19                     | 65058       | 9079 | 139552 | 26            | 6955 | 267500         | 65084       | 16034 | 246359 |
| 2019/20                     | 66410       | 9189 | 138368 | 26            | 7035 | 270577         | 66436       | 16224 | 244205 |
| 2020/21                     | 66762       | 9300 | 139301 | 26            | 7115 | 273654         | 66788       | 16415 | 245778 |
| 2021/22                     | 67114       | 9410 | 140209 | 26            | 7195 | 276731         | 67140       | 16605 | 247319 |
| 2022/23                     | 67467       | 9523 | 141150 | 26            | 7275 | 279808         | 67493       | 16798 | 248885 |
| 2023/24                     | 67820       | 9636 | 142082 | 26            | 7355 | 282885         | 67846       | 16991 | 250435 |

## AREA & ROADWAY LIGHTING

The Area and Roadway Lighting sector represents only 0.5% of all sales within Manitoba. It includes electricity sales for the Sentinel Lighting and Street Lighting rate classes. Sentinel Lighting is an outdoor lighting service where units are available as rentals to an existing metered service or on an unmetered flat rate basis. Street Lighting includes all municipal roadway lighting in Manitoba. In the early 1990's, usage dropped due to conversion to energy-efficient, high-pressure, sodium vapour street lighting.

**Figure 9**



The Area and Roadway Lighting sector is forecast to increase from 90 GW.h in 2002/03 to 106 GW.h by 2023/24. Sentinel Lighting is forecast to increase by 300 rentals per year with an estimated usage of 515 kW.h each. Street Lighting is forecast to increase an average of 0.6 GW.h per year because most of the existing street lights have been converted through the DSM initiative. New street lighting additions should increase overall consumption.

| AREA & ROADWAY LIGHTING<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |       |            |                |             |                |
|-------------------------------------------------------------------|-------|------------|----------------|-------------|----------------|
| Fiscal Year                                                       | Sales | Adjustment | Adjusted Sales | Fiscal Year | Forecast Sales |
| 1982/83                                                           | 124   | 0          | 124            | 2003/04     | 90             |
| 1983/84                                                           | 125   | 0          | 125            | 2004/05     | 91             |
| 1984/85                                                           | 126   | 0          | 126            | 2005/06     | 92             |
| 1985/86                                                           | 124   | 0          | 124            | 2006/07     | 93             |
| 1986/87                                                           | 123   | 0          | 123            | 2007/08     | 93             |
| 1987/88                                                           | 128   | 0          | 128            | 2008/09     | 94             |
| 1988/89                                                           | 128   | 0          | 128            | 2009/10     | 95             |
| 1989/90                                                           | 128   | 0          | 128            | 2010/11     | 96             |
| 1990/91                                                           | 128   | 0          | 128            | 2011/12     | 96             |
| 1991/92                                                           | 129   | 0          | 129            | 2012/13     | 97             |
| 1992/93                                                           | 123   | 0          | 123            | 2013/14     | 98             |
| 1993/94                                                           | 111   | 0          | 111            | 2014/15     | 99             |
| 1994/95                                                           | 92    | 0          | 92             | 2015/16     | 99             |
| 1995/96                                                           | 87    | 0          | 87             | 2016/17     | 100            |
| 1996/97                                                           | 86    | 0          | 86             | 2017/18     | 101            |
| 1997/98                                                           | 87    | 0          | 87             | 2018/19     | 102            |
| 1998/99                                                           | 87    | 0          | 87             | 2019/20     | 103            |
| 1999/00                                                           | 89    | 0          | 89             | 2020/21     | 103            |
| 2000/01                                                           | 87    | 0          | 87             | 2021/22     | 104            |
| 2001/02                                                           | 89    | 0          | 89             | 2022/23     | 105            |
| 2002/03                                                           | 90    | 0          | 90             | 2023/24     | 106            |



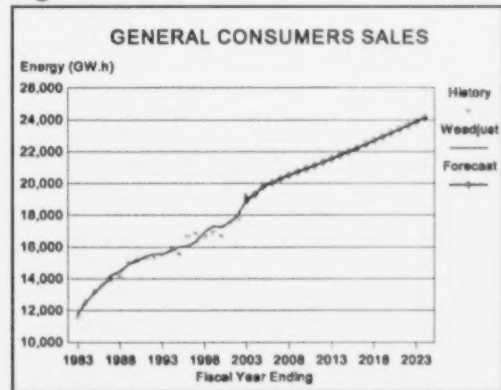
Table 9

| AREA AND ROADWAY LIGHTING |                     |      |                  |      |                 |      |                |      |
|---------------------------|---------------------|------|------------------|------|-----------------|------|----------------|------|
| Fiscal Year               | Sentinel Flat Rates |      | Sentinel Rentals |      | Street Lighting |      | Total Lighting |      |
|                           | Mtrs                | GW.h | Mtrs             | GW.h | Mtrs            | GW.h | Mtrs           | GW.h |
| 1991/92                   | 14505               | 15   | 5447             | 0    | 805             | 113  | 20757          | 128  |
| 1992/93                   | 15103               | 13   | 5399             | 0    | 830             | 110  | 21332          | 123  |
| 1993/94                   | 15597               | 14   | 5422             | 0    | 841             | 97   | 21860          | 111  |
| 1994/95                   | 15945               | 8    | 5394             | 0    | 781             | 84   | 22120          | 92   |
| 1995/96                   | 16461               | 8    | 5383             | 0    | 753             | 79   | 22597          | 87   |
| 1996/97                   | 17146               | 9    | 5431             | 0    | 738             | 78   | 23315          | 87   |
| 1997/98                   | 17723               | 9    | 5482             | 0    | 736             | 78   | 23941          | 87   |
| 1998/99                   | 18144               | 9    | 5507             | 0    | 768             | 78   | 24419          | 87   |
| 1999/00                   | 18575               | 10   | 5468             | 0    | 740             | 79   | 25083          | 89   |
| 2000/01                   | 19029               | 10   | 5483             | 0    | 738             | 77   | 25250          | 87   |
| 2001/02                   | 19364               | 10   | 5475             | 0    | 743             | 79   | 25582          | 89   |
| 2002/03                   | 19556               | 10   | 5501             | 0    | 748             | 80   | 25805          | 90   |
| 2003/04                   | 19700               | 10   | 5475             | 0    | 750             | 80   | 25925          | 90   |
| 2004/05                   | 20000               | 10   | 5475             | 0    | 752             | 81   | 26227          | 91   |
| 2005/06                   | 20300               | 10   | 5475             | 0    | 754             | 81   | 26529          | 91   |
| 2006/07                   | 20600               | 11   | 5475             | 0    | 756             | 82   | 26831          | 93   |
| 2007/08                   | 20900               | 11   | 5475             | 0    | 758             | 83   | 27133          | 94   |
| 2008/09                   | 21200               | 11   | 5475             | 0    | 760             | 83   | 27435          | 94   |
| 2009/10                   | 21500               | 11   | 5475             | 0    | 762             | 84   | 27737          | 95   |
| 2010/11                   | 21800               | 11   | 5475             | 0    | 764             | 84   | 28039          | 95   |
| 2011/12                   | 22100               | 11   | 5475             | 0    | 766             | 85   | 28341          | 96   |
| 2012/13                   | 22400               | 12   | 5475             | 0    | 768             | 86   | 28643          | 98   |
| 2013/14                   | 22700               | 12   | 5475             | 0    | 770             | 86   | 28945          | 98   |
| 2014/15                   | 23000               | 12   | 5475             | 0    | 772             | 87   | 29247          | 99   |
| 2015/16                   | 23300               | 12   | 5475             | 0    | 774             | 87   | 29549          | 99   |
| 2016/17                   | 23600               | 12   | 5475             | 0    | 776             | 88   | 29851          | 100  |
| 2017/18                   | 23900               | 12   | 5475             | 0    | 778             | 89   | 30153          | 101  |
| 2018/19                   | 24200               | 12   | 5475             | 0    | 780             | 89   | 30455          | 101  |
| 2019/20                   | 24500               | 13   | 5475             | 0    | 782             | 90   | 30757          | 103  |
| 2020/21                   | 24800               | 13   | 5475             | 0    | 784             | 91   | 31059          | 104  |
| 2021/22                   | 25100               | 13   | 5475             | 0    | 786             | 91   | 31361          | 104  |
| 2022/23                   | 25400               | 13   | 5475             | 0    | 788             | 92   | 31663          | 105  |
| 2023/24                   | 25700               | 13   | 5475             | 0    | 790             | 92   | 31965          | 105  |

## GENERAL CONSUMERS

The General Consumers category consists of all sales delivered to customers in Manitoba. This category includes the total of all sales from the Residential, General Service and Lighting groups. The General Service sector makes up about two-thirds, the Residential sector makes up about one-third and the Lighting group is only 0.5% of all sales. The adjacent graph shows that General Consumers sales have grown steadily over the last twenty years. The high growth rates in the 80's were due to electric space heating conversions.

**Figure 10**



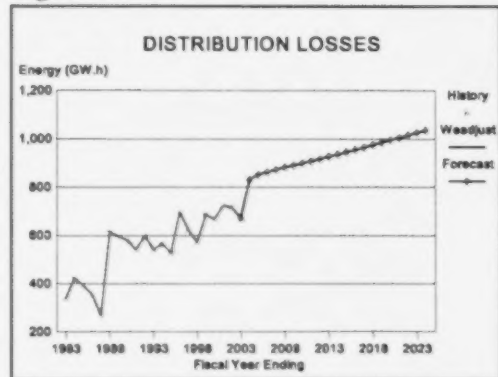
The General Consumers category is forecast to increase from a weather-adjusted base of 18 947 GW.h in 2002/03 to 24 124 GW.h by 2023/24. This represents an average growth of 247 GW.h per year, which is significantly lower than the ten year annual growth rate of 342 GW.h. The reasons for growth are previously specified in the Residential and General Service sections of this report.

| GENERAL CONSUMERS<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |       |            |                |             |                |
|-------------------------------------------------------------|-------|------------|----------------|-------------|----------------|
| Fiscal Year                                                 | Sales | Adjustment | Adjusted Sales | Fiscal Year | Forecast Sales |
| 1982/83                                                     | 11626 | 157        | 11783          | 2003/04     | 19314          |
| 1983/84                                                     | 12573 | -64        | 12509          | 2004/05     | 19830          |
| 1984/85                                                     | 13226 | -89        | 13137          | 2005/06     | 20051          |
| 1985/86                                                     | 13670 | -63        | 13607          | 2006/07     | 20292          |
| 1986/87                                                     | 13922 | 301        | 14223          | 2007/08     | 20519          |
| 1987/88                                                     | 14186 | 271        | 14457          | 2008/09     | 20720          |
| 1988/89                                                     | 15041 | -128       | 14913          | 2009/10     | 20919          |
| 1989/90                                                     | 15245 | -131       | 15114          | 2010/11     | 21118          |
| 1990/91                                                     | 15362 | 12         | 15374          | 2011/12     | 21327          |
| 1991/92                                                     | 15358 | 195        | 15553          | 2012/13     | 21546          |
| 1992/93                                                     | 15566 | -34        | 15532          | 2013/14     | 21762          |
| 1993/94                                                     | 15870 | -115       | 15755          | 2014/15     | 21994          |
| 1994/95                                                     | 15600 | 394        | 15994          | 2015/16     | 22224          |
| 1995/96                                                     | 16654 | -590       | 16064          | 2016/17     | 22457          |
| 1996/97                                                     | 16851 | -509       | 16342          | 2017/18     | 22690          |
| 1997/98                                                     | 16681 | 250        | 16931          | 2018/19     | 22924          |
| 1998/99                                                     | 16929 | 382        | 17311          | 2019/20     | 23160          |
| 1999/00                                                     | 16696 | 553        | 17249          | 2020/21     | 23398          |
| 2000/01                                                     | 17590 | -29        | 17561          | 2021/22     | 23638          |
| 2001/02                                                     | 17805 | 269        | 18074          | 2022/23     | 23880          |
| 2002/03                                                     | 19246 | -299       | 18947          | 2023/24     | 24124          |

## DISTRIBUTION LOSSES

The Distribution Losses category represents the resistance losses incurred in delivering power from the distribution station to the customers' meter. These losses are the difference between Manitoba Load at Common Bus less Construction and General Consumers less Diesel. Diesel sales are excluded because they are not part of the Integrated System. The losses vary because General Consumers sales are measured on a cycle billing basis and Common Bus is measured on a calendar month basis. Use at the customers' meter lags the delivery of power to the Common Bus.

**Figure 11**



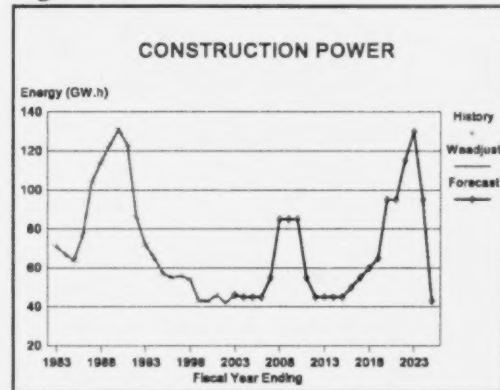
This category also includes unbilled sales and the error associated with flat rate estimates. Unbilled sales include energy used by Manitoba Hydro offices, Customer Accounting adjustments and energy lost through theft. Flat rate estimates include a number of unmetered services where energy is estimated and subject to inaccuracy. Distribution losses are forecast to be 4.3% higher than General Consumers less Diesel.

| DISTRIBUTION LOSSES<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |        |            |                 |             |                 |
|---------------------------------------------------------------|--------|------------|-----------------|-------------|-----------------|
| Fiscal Year                                                   | Losses | Adjustment | Adjusted Losses | Fiscal Year | Forecast Losses |
| 1982/83                                                       | 338    | 0          | 338             | 2003/04     | 830             |
| 1983/84                                                       | 419    | 0          | 419             | 2004/05     | 852             |
| 1984/85                                                       | 389    | 0          | 389             | 2005/06     | 862             |
| 1985/86                                                       | 354    | 0          | 354             | 2006/07     | 872             |
| 1986/87                                                       | 269    | 0          | 269             | 2007/08     | 882             |
| 1987/88                                                       | 614    | 0          | 614             | 2008/09     | 890             |
| 1988/89                                                       | 508    | 0          | 508             | 2009/10     | 899             |
| 1989/90                                                       | 487    | 0          | 487             | 2010/11     | 907             |
| 1990/91                                                       | 455    | 0          | 455             | 2011/12     | 916             |
| 1991/92                                                       | 559    | 0          | 559             | 2012/13     | 926             |
| 1992/93                                                       | 530    | 0          | 530             | 2013/14     | 935             |
| 1993/94                                                       | 565    | 0          | 565             | 2014/15     | 945             |
| 1994/95                                                       | 526    | 0          | 526             | 2015/16     | 955             |
| 1995/96                                                       | 696    | 0          | 696             | 2016/17     | 965             |
| 1996/97                                                       | 621    | 0          | 621             | 2017/18     | 975             |
| 1997/98                                                       | 572    | 0          | 572             | 2018/19     | 985             |
| 1998/99                                                       | 685    | 0          | 685             | 2019/20     | 995             |
| 1999/00                                                       | 666    | 0          | 666             | 2020/21     | 1005            |
| 2000/01                                                       | 723    | 0          | 723             | 2021/22     | 1015            |
| 2001/02                                                       | 716    | 0          | 716             | 2022/23     | 1026            |
| 2002/03                                                       | 671    | 0          | 671             | 2023/24     | 1036            |

## CONSTRUCTION POWER

The Construction Power category represents the energy used by Manitoba Hydro and its contractors in the construction of major capital works such as generating stations, converter stations and major transmission lines. This category also includes station service until a plant is commissioned. The adjacent graph shows that consumption increased significantly during the peak of Limestone development. Recently, the Construction figures include about 45 GW.h for consumption at the Gillam, Limestone and Kettle townsites.

Figure 12



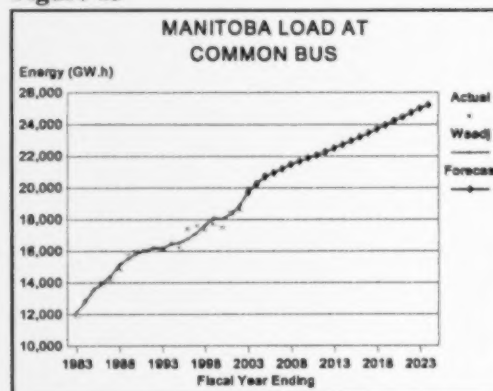
The Construction Power category is forecast to be 45 GW.h per year until the construction of Wuskwatim and Gull generating stations commence. The most recent, approved development plans project for a first power date of 2009 and 2023 for the Wuskwatim and Gull generating stations, respectively. The sequencing of generation development plans are subject to change given an appropriate business case.

| CONSTRUCTION POWER<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |     |            |              |             |              |
|--------------------------------------------------------------|-----|------------|--------------|-------------|--------------|
| Fiscal Year                                                  | Use | Adjustment | Adjusted Use | Fiscal Year | Forecast Use |
| 1982/83                                                      | 71  | 0          | 71           | 2003/04     | 45           |
| 1983/84                                                      | 67  | 0          | 67           | 2004/05     | 45           |
| 1984/85                                                      | 64  | 0          | 64           | 2005/06     | 45           |
| 1985/86                                                      | 77  | 0          | 77           | 2006/07     | 55           |
| 1986/87                                                      | 104 | 0          | 104          | 2007/08     | 85           |
| 1987/88                                                      | 114 | 0          | 114          | 2008/09     | 85           |
| 1988/89                                                      | 123 | 0          | 123          | 2009/10     | 85           |
| 1989/90                                                      | 131 | 0          | 131          | 2010/11     | 55           |
| 1990/91                                                      | 123 | 0          | 123          | 2011/12     | 45           |
| 1991/92                                                      | 86  | 0          | 86           | 2012/13     | 45           |
| 1992/93                                                      | 72  | 0          | 72           | 2013/14     | 45           |
| 1993/94                                                      | 65  | 0          | 65           | 2014/15     | 45           |
| 1994/95                                                      | 57  | 0          | 57           | 2015/16     | 50           |
| 1995/96                                                      | 55  | 0          | 55           | 2016/17     | 55           |
| 1996/97                                                      | 56  | 0          | 56           | 2017/18     | 60           |
| 1997/98                                                      | 54  | 0          | 54           | 2018/19     | 65           |
| 1998/99                                                      | 43  | 0          | 43           | 2019/20     | 95           |
| 1999/00                                                      | 43  | 0          | 43           | 2020/21     | 95           |
| 2000/01                                                      | 46  | 0          | 46           | 2021/22     | 115          |
| 2001/02                                                      | 42  | 0          | 42           | 2022/23     | 130          |
| 2002/03                                                      | 46  | 0          | 46           | 2023/24     | 95           |

## MANITOBA LOAD AT COMMON BUS

Manitoba Load at Common Bus is the sum of all Manitoba Hydro and Winnipeg Hydro loads at Common Bus. It represents the total load measured from all the distribution points within Manitoba. It includes all sales to Manitoba customers plus associated distribution losses. This category excludes transmission losses and station service. In the 1980's, load growth was due to rural electric space heat conversions and downtown development in Winnipeg. In the 1990's, load growth was due to Industrial development in the Manitoba Hydro service area.

**Figure 13**



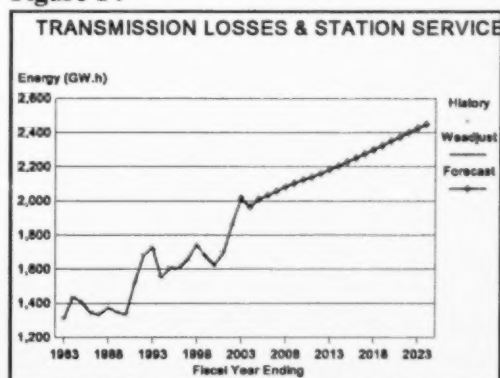
The Manitoba Load at Common Bus category is forecast to increase from a weather-adjusted base of 19 706 GW.h in 2002/03 to 25 228 GW.h by 2023/24. This represents an average growth of 263 GW.h per year, which is significantly lower than the ten year annual growth rate of 354 GW.h. Most of this load growth will occur due to Industrial development in the Manitoba Hydro service area.

| MANITOBA LOAD AT COMMON BUS<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |       |            |               |             |               |
|-----------------------------------------------------------------------|-------|------------|---------------|-------------|---------------|
| Fiscal Year                                                           | MLCB  | Adjustment | Adjusted MLCB | Fiscal Year | Forecast MLCB |
| 1982/83                                                               | 11949 | 193        | 12142         | 2003/04     | 20241         |
| 1983/84                                                               | 12951 | -141       | 12810         | 2004/05     | 20715         |
| 1984/85                                                               | 13605 | -56        | 13549         | 2005/06     | 20944         |
| 1985/86                                                               | 14021 | -49        | 13972         | 2006/07     | 21205         |
| 1986/87                                                               | 14160 | 284        | 14444         | 2007/08     | 21471         |
| 1987/88                                                               | 14886 | 251        | 15137         | 2008/09     | 21680         |
| 1988/89                                                               | 15760 | -239       | 15521         | 2009/10     | 21886         |
| 1989/90                                                               | 15964 | -94        | 15870         | 2010/11     | 22063         |
| 1990/91                                                               | 16031 | -6         | 16025         | 2011/12     | 22270         |
| 1991/92                                                               | 16067 | 160        | 16227         | 2012/13     | 22498         |
| 1992/93                                                               | 16166 | 2          | 16168         | 2013/14     | 22723         |
| 1993/94                                                               | 16523 | -87        | 16436         | 2014/15     | 22963         |
| 1994/95                                                               | 16185 | 330        | 16515         | 2015/16     | 23207         |
| 1995/96                                                               | 17418 | -626       | 16792         | 2016/17     | 23454         |
| 1996/97                                                               | 17590 | -447       | 17143         | 2017/18     | 23702         |
| 1997/98                                                               | 17350 | 269        | 17619         | 2018/19     | 23950         |
| 1998/99                                                               | 17722 | 373        | 18095         | 2019/20     | 24226         |
| 1999/00                                                               | 17479 | 538        | 18017         | 2020/21     | 24474         |
| 2000/01                                                               | 18428 | -96        | 18332         | 2021/22     | 24743         |
| 2001/02                                                               | 18655 | 184        | 18839         | 2022/23     | 25010         |
| 2002/03                                                               | 19953 | -247       | 19706         | 2023/24     | 25228         |

## TRANSMISSION LOSSES

Transmission Losses category represents the amount of energy that is lost in delivering power from the generation stations to all of the distribution points on the Common Bus. This category only contains losses associated with supplying Manitoba customers. Losses attributable to exports and the gains attributable to imports are excluded. It is calculated as the difference between Net Total Energy minus the Manitoba Load at Common Bus. Transmission losses are substantial because most of the northern generation is transmitted to southern distribution points - 900 kilometres away. Transmission losses vary significantly depending on system configuration, outages and the magnitude of the load being transmitted over the lines. Note that the Transmission losses increased dramatically in 2002/03 due to the failure of two transformers on the HVDC system.

**Figure 14**



Transmission Losses are forecasted to be 9.7% of the Manitoba Load at Common Bus. Transmission Losses will increase as the Manitoba Load at Common Bus increases.

| TRANSMISSION LOSSES<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |        |            |                 |             |                 |
|---------------------------------------------------------------|--------|------------|-----------------|-------------|-----------------|
| Fiscal Year                                                   | Losses | Adjustment | Adjusted Losses | Fiscal Year | Forecast Losses |
| 1982/83                                                       | 1311   | 0          | 1311            | 2003/04     | 1965            |
| 1983/84                                                       | 1436   | 0          | 1436            | 2004/05     | 2010            |
| 1984/85                                                       | 1409   | 0          | 1409            | 2005/06     | 2032            |
| 1985/86                                                       | 1344   | 0          | 1344            | 2006/07     | 2057            |
| 1986/87                                                       | 1335   | 0          | 1335            | 2007/08     | 2082            |
| 1987/88                                                       | 1374   | 0          | 1374            | 2008/09     | 2103            |
| 1988/89                                                       | 1348   | 0          | 1348            | 2009/10     | 2123            |
| 1989/90                                                       | 1334   | 0          | 1334            | 2010/11     | 2139            |
| 1990/91                                                       | 1522   | 0          | 1522            | 2011/12     | 2160            |
| 1991/92                                                       | 1680   | 0          | 1680            | 2012/13     | 2182            |
| 1992/93                                                       | 1728   | 0          | 1728            | 2013/14     | 2204            |
| 1993/94                                                       | 1552   | 0          | 1552            | 2014/15     | 2228            |
| 1994/95                                                       | 1609   | 0          | 1609            | 2015/16     | 2251            |
| 1995/96                                                       | 1606   | 0          | 1606            | 2016/17     | 2275            |
| 1996/97                                                       | 1660   | 0          | 1660            | 2017/18     | 2299            |
| 1997/98                                                       | 1745   | 0          | 1745            | 2018/19     | 2323            |
| 1998/99                                                       | 1675   | 0          | 1675            | 2019/20     | 2350            |
| 1999/00                                                       | 1623   | 0          | 1623            | 2020/21     | 2373            |
| 2000/01                                                       | 1696   | 0          | 1696            | 2021/22     | 2400            |
| 2001/02                                                       | 1894   | 0          | 1894            | 2022/23     | 2426            |
| 2002/03                                                       | 2012   | 0          | 2012            | 2023/24     | 2447            |

**Table 10**



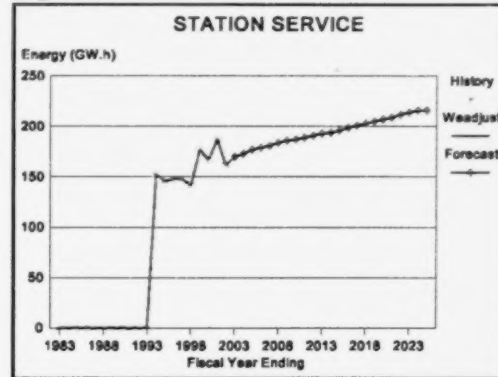
**MONTHLY TRANSMISSION LOSSES**  
Energy (GW.h)

| Fiscal Year    | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Total |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2002/03 Actual | 152 | 146 | 151 | 150 | 150 | 141 | 189 | 168 | 208 | 196 | 151 | 209 | 2012  |
| 2003/04        | 147 | 145 | 144 | 146 | 150 | 143 | 156 | 171 | 200 | 205 | 181 | 178 | 1965  |
| 2004/05        | 150 | 148 | 148 | 149 | 154 | 147 | 158 | 176 | 206 | 210 | 180 | 182 | 2010  |
| 2005/06        | 151 | 150 | 149 | 151 | 156 | 148 | 160 | 178 | 208 | 213 | 182 | 184 | 2032  |
| 2006/07        | 153 | 152 | 151 | 153 | 159 | 150 | 162 | 180 | 210 | 215 | 184 | 187 | 2057  |
| 2007/08        | 155 | 154 | 153 | 155 | 161 | 152 | 164 | 183 | 213 | 218 | 186 | 189 | 2082  |
| 2008/09        | 156 | 155 | 155 | 157 | 163 | 153 | 165 | 184 | 216 | 220 | 188 | 191 | 2103  |
| 2009/10        | 157 | 157 | 156 | 159 | 165 | 154 | 167 | 186 | 218 | 222 | 190 | 193 | 2123  |
| 2010/11        | 158 | 158 | 157 | 161 | 166 | 155 | 168 | 187 | 219 | 224 | 191 | 195 | 2139  |
| 2011/12        | 159 | 159 | 159 | 163 | 168 | 157 | 169 | 189 | 222 | 226 | 193 | 196 | 2160  |
| 2012/13        | 161 | 161 | 161 | 165 | 170 | 158 | 171 | 191 | 224 | 228 | 195 | 199 | 2182  |
| 2013/14        | 162 | 162 | 162 | 166 | 172 | 160 | 172 | 193 | 227 | 231 | 197 | 201 | 2204  |
| 2014/15        | 164 | 164 | 164 | 168 | 174 | 161 | 174 | 195 | 229 | 233 | 199 | 203 | 2228  |
| 2015/16        | 165 | 165 | 165 | 169 | 175 | 163 | 176 | 197 | 232 | 236 | 201 | 205 | 2251  |
| 2016/17        | 167 | 167 | 167 | 171 | 177 | 164 | 177 | 199 | 235 | 239 | 204 | 208 | 2275  |
| 2017/18        | 169 | 168 | 168 | 172 | 179 | 166 | 179 | 201 | 238 | 242 | 206 | 210 | 2299  |
| 2018/19        | 170 | 170 | 170 | 174 | 180 | 167 | 181 | 204 | 241 | 245 | 209 | 212 | 2323  |
| 2019/20        | 172 | 172 | 172 | 176 | 182 | 169 | 183 | 206 | 244 | 248 | 211 | 215 | 2350  |
| 2020/21        | 174 | 173 | 173 | 177 | 184 | 170 | 185 | 208 | 247 | 251 | 214 | 217 | 2373  |
| 2021/22        | 176 | 175 | 175 | 179 | 186 | 172 | 186 | 211 | 250 | 254 | 216 | 220 | 2400  |
| 2022/23        | 177 | 177 | 177 | 181 | 188 | 174 | 188 | 213 | 253 | 257 | 219 | 222 | 2426  |
| 2023/24        | 179 | 178 | 178 | 182 | 189 | 175 | 190 | 215 | 255 | 260 | 221 | 224 | 2447  |

## STATION SERVICE

The Station Service category measures the energy used by power plants to generate power and service their own load. Energy and peak estimates can either include or exclude station service, depending on the purpose for which they are to be used. Most energy and peak numbers in this document exclude station service. "Net" numbers exclude station service and "Gross" numbers include station service. This is explained in the Glossary of Terms. Station Service energy was not measured prior to 1993/94 and was included in the Transmission Losses category.

Figure 15



Station Service energy is forecast to be 0.9% of the Manitoba Load at Common Bus. Station Service energy is forecast to increase from 170 GW.h in 2002/03 to 216 GW.h by 2023/24. Station Service at the time of peak is forecast to increase from 32 MW in 2002/03 to 42 MW by 2023/24.

| STATION SERVICE<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |     |            |              |             |              |
|-----------------------------------------------------------|-----|------------|--------------|-------------|--------------|
| Fiscal Year                                               | Use | Adjustment | Adjusted Use | Fiscal Year | Forecast Use |
| 1982/83                                                   | 0   | 0          | 0            | 2003/04     | 173          |
| 1983/84                                                   | 0   | 0          | 0            | 2004/05     | 177          |
| 1984/85                                                   | 0   | 0          | 0            | 2005/06     | 179          |
| 1985/86                                                   | 0   | 0          | 0            | 2006/07     | 181          |
| 1986/87                                                   | 0   | 0          | 0            | 2007/08     | 184          |
| 1987/88                                                   | 0   | 0          | 0            | 2008/09     | 186          |
| 1988/89                                                   | 0   | 0          | 0            | 2009/10     | 187          |
| 1989/90                                                   | 0   | 0          | 0            | 2010/11     | 189          |
| 1990/91                                                   | 0   | 0          | 0            | 2011/12     | 191          |
| 1991/92                                                   | 0   | 0          | 0            | 2012/13     | 193          |
| 1992/93                                                   | 0   | 0          | 0            | 2013/14     | 194          |
| 1993/94                                                   | 152 | 0          | 152          | 2014/15     | 196          |
| 1994/95                                                   | 146 | 0          | 146          | 2015/16     | 199          |
| 1995/96                                                   | 148 | 0          | 148          | 2016/17     | 201          |
| 1996/97                                                   | 148 | 0          | 148          | 2017/18     | 203          |
| 1997/98                                                   | 142 | 0          | 142          | 2018/19     | 205          |
| 1998/99                                                   | 177 | 0          | 177          | 2019/20     | 207          |
| 1999/00                                                   | 167 | 0          | 167          | 2020/21     | 209          |
| 2000/01                                                   | 187 | 0          | 187          | 2021/22     | 212          |
| 2001/02                                                   | 162 | 0          | 162          | 2022/23     | 214          |
| 2002/03                                                   | 170 | 0          | 170          | 2023/24     | 216          |



Table 11

| MONTHLY STATION SERVICE<br>Energy (GW.h) |     |     |     |     |     |     |     |     |     |     |     |     |       |
|------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| Fiscal Year                              | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Total |
| 2002/03 Actual                           | 16  | 14  | 9   | 14  | 9   | 8   | 11  | 14  | 18  | 20  | 19  | 19  | 170   |
| 2003/04                                  | 16  | 13  | 9   | 12  | 10  | 8   | 12  | 14  | 19  | 21  | 19  | 19  | 173   |
| 2004/05                                  | 16  | 13  | 9   | 12  | 10  | 8   | 12  | 15  | 20  | 22  | 20  | 20  | 177   |
| 2005/06                                  | 16  | 13  | 9   | 12  | 10  | 9   | 12  | 15  | 20  | 22  | 20  | 20  | 179   |
| 2006/07                                  | 17  | 13  | 9   | 13  | 10  | 9   | 13  | 15  | 20  | 22  | 20  | 20  | 181   |
| 2007/08                                  | 17  | 13  | 9   | 13  | 11  | 9   | 13  | 15  | 21  | 23  | 21  | 20  | 184   |
| 2008/09                                  | 17  | 13  | 9   | 13  | 11  | 9   | 13  | 15  | 21  | 23  | 21  | 21  | 186   |
| 2009/10                                  | 17  | 14  | 9   | 13  | 11  | 9   | 13  | 15  | 21  | 23  | 21  | 21  | 187   |
| 2010/11                                  | 17  | 14  | 10  | 13  | 11  | 9   | 13  | 16  | 21  | 23  | 21  | 21  | 189   |
| 2011/12                                  | 17  | 14  | 10  | 13  | 11  | 9   | 13  | 16  | 21  | 24  | 21  | 21  | 191   |
| 2012/13                                  | 18  | 14  | 10  | 13  | 11  | 9   | 13  | 16  | 21  | 24  | 22  | 21  | 193   |
| 2013/14                                  | 18  | 14  | 10  | 14  | 11  | 9   | 14  | 16  | 22  | 24  | 22  | 22  | 194   |
| 2014/15                                  | 18  | 14  | 10  | 14  | 11  | 9   | 14  | 16  | 22  | 24  | 22  | 22  | 196   |
| 2015/16                                  | 18  | 14  | 10  | 14  | 11  | 9   | 14  | 16  | 22  | 24  | 22  | 22  | 199   |
| 2016/17                                  | 18  | 15  | 10  | 14  | 12  | 10  | 14  | 17  | 22  | 25  | 23  | 22  | 201   |
| 2017/18                                  | 19  | 15  | 10  | 14  | 12  | 10  | 14  | 17  | 23  | 25  | 23  | 23  | 203   |
| 2018/19                                  | 19  | 15  | 10  | 14  | 12  | 10  | 14  | 17  | 23  | 25  | 23  | 23  | 205   |
| 2019/20                                  | 19  | 15  | 11  | 14  | 12  | 10  | 14  | 17  | 23  | 26  | 23  | 23  | 207   |
| 2020/21                                  | 19  | 15  | 11  | 15  | 12  | 10  | 15  | 17  | 23  | 26  | 24  | 23  | 209   |
| 2021/22                                  | 19  | 15  | 11  | 15  | 12  | 10  | 15  | 18  | 24  | 26  | 24  | 24  | 212   |
| 2022/23                                  | 20  | 16  | 11  | 15  | 12  | 10  | 15  | 18  | 24  | 26  | 24  | 24  | 214   |
| 2023/24                                  | 20  | 16  | 11  | 15  | 12  | 10  | 15  | 18  | 24  | 27  | 24  | 24  | 216   |

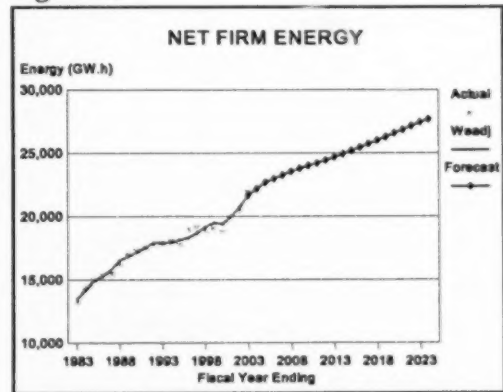
Table 12

| MONTHLY STATION SERVICE<br>Peak (MW) |     |     |     |     |     |     |     |     |     |     |     |     |        |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| Fiscal Year                          | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Annual |
| 2002/03 Actual                       | 26  | 26  | 18  | 19  | 17  | 10  | 15  | 32  | 27  | 33  | 32  | 29  | 32     |
| 2003/04                              | 27  | 24  | 15  | 15  | 17  | 14  | 19  | 34  | 32  | 36  | 36  | 28  | 35     |
| 2004/05                              | 27  | 25  | 15  | 15  | 18  | 14  | 20  | 35  | 33  | 36  | 37  | 29  | 36     |
| 2005/06                              | 27  | 25  | 15  | 16  | 18  | 14  | 20  | 35  | 33  | 37  | 37  | 29  | 36     |
| 2006/07                              | 28  | 26  | 16  | 16  | 18  | 14  | 20  | 35  | 33  | 37  | 37  | 29  | 37     |
| 2007/08                              | 28  | 26  | 16  | 16  | 19  | 15  | 20  | 36  | 34  | 37  | 38  | 29  | 37     |
| 2008/09                              | 28  | 26  | 16  | 16  | 19  | 15  | 20  | 36  | 34  | 38  | 38  | 30  | 37     |
| 2009/10                              | 28  | 26  | 16  | 16  | 19  | 15  | 21  | 36  | 34  | 38  | 38  | 30  | 37     |
| 2010/11                              | 28  | 27  | 16  | 17  | 19  | 15  | 21  | 36  | 35  | 38  | 38  | 30  | 38     |
| 2011/12                              | 29  | 27  | 16  | 17  | 20  | 15  | 21  | 37  | 35  | 38  | 39  | 30  | 38     |
| 2012/13                              | 29  | 27  | 17  | 17  | 20  | 15  | 21  | 37  | 35  | 38  | 39  | 31  | 38     |
| 2013/14                              | 29  | 27  | 17  | 17  | 20  | 15  | 21  | 37  | 35  | 39  | 39  | 31  | 38     |
| 2014/15                              | 29  | 28  | 17  | 17  | 20  | 16  | 21  | 37  | 36  | 39  | 40  | 31  | 39     |
| 2015/16                              | 30  | 28  | 17  | 18  | 20  | 16  | 22  | 38  | 36  | 40  | 40  | 31  | 39     |
| 2016/17                              | 30  | 28  | 17  | 18  | 21  | 16  | 22  | 38  | 36  | 40  | 40  | 32  | 40     |
| 2017/18                              | 30  | 29  | 17  | 18  | 21  | 16  | 22  | 39  | 37  | 40  | 41  | 32  | 40     |
| 2018/19                              | 31  | 29  | 18  | 18  | 21  | 16  | 22  | 39  | 37  | 41  | 41  | 32  | 40     |
| 2019/20                              | 31  | 29  | 18  | 18  | 21  | 17  | 23  | 39  | 37  | 41  | 42  | 33  | 41     |
| 2020/21                              | 31  | 29  | 18  | 19  | 22  | 17  | 23  | 40  | 38  | 41  | 42  | 33  | 41     |
| 2021/22                              | 32  | 30  | 18  | 19  | 22  | 17  | 23  | 40  | 38  | 42  | 42  | 33  | 42     |
| 2022/23                              | 32  | 30  | 18  | 19  | 22  | 17  | 23  | 41  | 39  | 42  | 43  | 34  | 42     |
| 2023/24                              | 32  | 30  | 19  | 19  | 22  | 17  | 23  | 41  | 39  | 43  | 43  | 34  | 42     |

## NET FIRM ENERGY

The Net Firm Energy category includes all electricity that is generated to meet the firm energy requirements of all customers within Manitoba. It excludes non-firm (interruptible loads) and station service loads. It is calculated by subtracting non-firm sales and station service loads from the Gross Total Energy requirements. Net Firm Energy is a critical factor in determining Manitoba Hydro's future development plans. Net Firm Energy has grown steadily during the past two decades, except for the economic slow down in the early 1990's.

Figure 16



The Net Firm Energy category is forecast to increase from a weather-adjusted base of 21 668 GW.h in 2002/03 to 27 675 GW.h by 2023/24. This represents an average growth of 286 GW.h per year, which is much lower than the ten year annual growth rate of 377 GW.h.

| NET FIRM ENERGY<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |        |            |                 |             |                 |
|-----------------------------------------------------------|--------|------------|-----------------|-------------|-----------------|
| Fiscal Year                                               | Energy | Adjustment | Adjusted Energy | Fiscal Year | Forecast Energy |
| 1982/83                                                   | 13260  | 212        | 13472           | 2003/04     | 22171           |
| 1983/84                                                   | 14387  | -155       | 14232           | 2004/05     | 22690           |
| 1984/85                                                   | 15014  | -62        | 14952           | 2005/06     | 22976           |
| 1985/86                                                   | 15366  | -53        | 15313           | 2006/07     | 23262           |
| 1986/87                                                   | 15495  | 313        | 15808           | 2007/08     | 23554           |
| 1987/88                                                   | 16260  | 276        | 16536           | 2008/09     | 23783           |
| 1988/89                                                   | 17108  | -263       | 16845           | 2009/10     | 24009           |
| 1989/90                                                   | 17298  | -104       | 17194           | 2010/11     | 24203           |
| 1990/91                                                   | 17553  | -7         | 17546           | 2011/12     | 24430           |
| 1991/92                                                   | 17748  | 176        | 17924           | 2012/13     | 24680           |
| 1992/93                                                   | 17894  | 2          | 17896           | 2013/14     | 24927           |
| 1993/94                                                   | 18048  | -95        | 17953           | 2014/15     | 25191           |
| 1994/95                                                   | 17784  | 363        | 18147           | 2015/16     | 25458           |
| 1995/96                                                   | 19000  | -689       | 18311           | 2016/17     | 25729           |
| 1996/97                                                   | 19173  | -491       | 18682           | 2017/18     | 26001           |
| 1997/98                                                   | 18872  | 296        | 19168           | 2018/19     | 26274           |
| 1998/99                                                   | 19095  | 411        | 19506           | 2019/20     | 26576           |
| 1999/00                                                   | 18804  | 592        | 19396           | 2020/21     | 26847           |
| 2000/01                                                   | 20075  | -106       | 19969           | 2021/22     | 27143           |
| 2001/02                                                   | 20494  | 202        | 20696           | 2022/23     | 27436           |
| 2002/03                                                   | 21940  | -272       | 21668           | 2023/24     | 27675           |

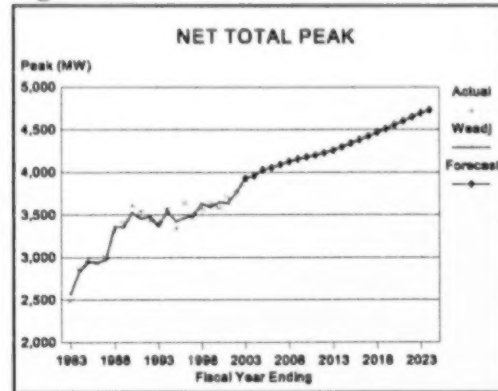
Table 13

| MONTHLY SCHEDULE OF NET FIRM ENERGY (GW.h)<br>Base Forecast      |      |      |      |      |      |      |      |      |      |      |      |      |       |
|------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Fiscal Year                                                      | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Total |
| 2002/03<br>Actual                                                | 1711 | 1615 | 1528 | 1603 | 1545 | 1527 | 1800 | 1950 | 2132 | 2321 | 2124 | 2084 | 21940 |
| 2003/04                                                          | 1684 | 1613 | 1556 | 1612 | 1642 | 1546 | 1738 | 1952 | 2293 | 2358 | 2106 | 2071 | 22171 |
| 2004/05                                                          | 1728 | 1654 | 1612 | 1654 | 1698 | 1591 | 1774 | 2008 | 2354 | 2411 | 2084 | 2121 | 22690 |
| 2005/06                                                          | 1748 | 1682 | 1632 | 1685 | 1725 | 1609 | 1801 | 2032 | 2372 | 2438 | 2106 | 2147 | 22976 |
| 2006/07                                                          | 1768 | 1705 | 1656 | 1712 | 1753 | 1631 | 1822 | 2054 | 2398 | 2462 | 2128 | 2172 | 23262 |
| 2007/08                                                          | 1789 | 1728 | 1680 | 1741 | 1781 | 1654 | 1844 | 2077 | 2425 | 2487 | 2150 | 2198 | 23554 |
| 2008/09                                                          | 1805 | 1747 | 1700 | 1764 | 1804 | 1671 | 1861 | 2094 | 2446 | 2506 | 2167 | 2218 | 23783 |
| 2009/10                                                          | 1821 | 1765 | 1719 | 1787 | 1828 | 1689 | 1878 | 2111 | 2467 | 2524 | 2184 | 2238 | 24009 |
| 2010/11                                                          | 1834 | 1781 | 1736 | 1808 | 1848 | 1704 | 1892 | 2126 | 2484 | 2539 | 2198 | 2254 | 24203 |
| 2011/12                                                          | 1850 | 1799 | 1755 | 1831 | 1872 | 1722 | 1908 | 2143 | 2504 | 2557 | 2214 | 2274 | 24430 |
| 2012/13                                                          | 1868 | 1820 | 1776 | 1857 | 1897 | 1741 | 1927 | 2162 | 2527 | 2578 | 2233 | 2296 | 24680 |
| 2013/14                                                          | 1887 | 1839 | 1795 | 1876 | 1916 | 1759 | 1947 | 2183 | 2551 | 2602 | 2254 | 2318 | 24927 |
| 2014/15                                                          | 1907 | 1859 | 1815 | 1897 | 1937 | 1779 | 1968 | 2206 | 2577 | 2628 | 2277 | 2342 | 25191 |
| 2015/16                                                          | 1928 | 1879 | 1834 | 1917 | 1958 | 1798 | 1989 | 2229 | 2603 | 2655 | 2300 | 2366 | 25458 |
| 2016/17                                                          | 1949 | 1900 | 1855 | 1938 | 1980 | 1818 | 2011 | 2252 | 2629 | 2682 | 2324 | 2391 | 25729 |
| 2017/18                                                          | 1970 | 1921 | 1875 | 1959 | 2001 | 1838 | 2033 | 2276 | 2656 | 2709 | 2347 | 2416 | 26001 |
| 2018/19                                                          | 1991 | 1942 | 1895 | 1981 | 2023 | 1858 | 2055 | 2299 | 2683 | 2736 | 2371 | 2440 | 26274 |
| 2019/20                                                          | 2014 | 1965 | 1918 | 2004 | 2046 | 1881 | 2079 | 2325 | 2712 | 2766 | 2398 | 2468 | 26576 |
| 2020/21                                                          | 2035 | 1986 | 1938 | 2025 | 2068 | 1900 | 2100 | 2349 | 2739 | 2793 | 2421 | 2493 | 26847 |
| 2021/22                                                          | 2058 | 2008 | 1960 | 2048 | 2091 | 1922 | 2124 | 2374 | 2768 | 2823 | 2447 | 2520 | 27143 |
| 2022/23                                                          | 2081 | 2031 | 1982 | 2071 | 2114 | 1944 | 2147 | 2399 | 2797 | 2852 | 2473 | 2546 | 27436 |
| 2023/24                                                          | 2099 | 2049 | 2000 | 2089 | 2133 | 1961 | 2166 | 2420 | 2820 | 2875 | 2493 | 2568 | 27675 |
| - See the Glossary of Terms for a definition of Net Firm Energy. |      |      |      |      |      |      |      |      |      |      |      |      |       |

## NET TOTAL PEAK

The Net Total Peak is defined to be the maximum integrated hourly load at generation adjusted for losses associated with exports or imports, less station service, but with curtailed loads added back in. The term "integrated" indicates that the average load within that peak hour is used. The Net Total Peak did not grow very much during the 1990's because many of our large Industrial customers have improved their efficiency. Manitoba Hydro is very diligent in helping our Industrial customers to improve the efficiency of their business operations.

Figure 17



The Net Total Peak is forecast to increase from a weather-adjusted base of 3 930 MW in 2002/03 to 4 730 MW by 2023/24. This represents an average growth of 38 MW per year, which is lower than the ten year annual growth rate of 56 MW.

| NET TOTAL PEAK<br>HISTORICAL/WEATHER ADJUSTMENT/FORECAST |      |            |               |             |               |
|----------------------------------------------------------|------|------------|---------------|-------------|---------------|
| Fiscal Year                                              | Peak | Adjustment | Adjusted Peak | Fiscal Year | Forecast Peak |
| 1982/83                                                  | 2494 | 79         | 2573          | 2003/04     | 3956          |
| 1983/84                                                  | 2875 | -32        | 2843          | 2004/05     | 4028          |
| 1984/85                                                  | 2974 | -22        | 2952          | 2005/06     | 4053          |
| 1985/86                                                  | 2945 | -8         | 2937          | 2006/07     | 4088          |
| 1986/87                                                  | 3003 | -30        | 2973          | 2007/08     | 4126          |
| 1987/88                                                  | 3326 | 32         | 3358          | 2008/09     | 4153          |
| 1988/89                                                  | 3403 | -46        | 3357          | 2009/10     | 4180          |
| 1989/90                                                  | 3611 | -92        | 3519          | 2010/11     | 4201          |
| 1990/91                                                  | 3542 | -84        | 3458          | 2011/12     | 4228          |
| 1991/92                                                  | 3435 | 46         | 3481          | 2012/13     | 4258          |
| 1992/93                                                  | 3404 | -34        | 3370          | 2013/14     | 4296          |
| 1993/94                                                  | 3567 | -22        | 3545          | 2014/15     | 4338          |
| 1994/95                                                  | 3342 | 82         | 3424          | 2015/16     | 4380          |
| 1995/96                                                  | 3647 | -181       | 3466          | 2016/17     | 4422          |
| 1996/97                                                  | 3476 | 19         | 3495          | 2017/18     | 4465          |
| 1997/98                                                  | 3573 | 60         | 3633          | 2018/19     | 4508          |
| 1998/99                                                  | 3639 | -46        | 3593          | 2019/20     | 4556          |
| 1999/00                                                  | 3588 | 61         | 3649          | 2020/21     | 4599          |
| 2000/01                                                  | 3708 | -71        | 3637          | 2021/22     | 4646          |
| 2001/02                                                  | 3760 | 9          | 3770          | 2022/23     | 4692          |
| 2002/03                                                  | 3916 | 14         | 3930          | 2023/24     | 4730          |

Table 14

| MONTHLY SCHEDULE OF NET TOTAL PEAK (MW)<br>Base Forecast        |      |      |      |      |      |      |      |      |      |      |      |      |        |
|-----------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Fiscal Year                                                     | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Annual |
| 2002/03<br>Actual                                               | 3061 | 2794 | 2764 | 2894 | 2722 | 2681 | 3024 | 3365 | 3633 | 3816 | 3916 | 3796 | 3916   |
| 2003/04                                                         | 2996 | 2733 | 2735 | 2744 | 2838 | 2708 | 2917 | 3427 | 3871 | 3928 | 3791 | 3503 | 3956   |
| 2004/05                                                         | 3059 | 2786 | 2803 | 2810 | 2906 | 2777 | 2982 | 3496 | 3955 | 3983 | 3862 | 3589 | 4028   |
| 2005/06                                                         | 3088 | 2824 | 2843 | 2853 | 2955 | 2807 | 3015 | 3528 | 3979 | 4014 | 3891 | 3609 | 4053   |
| 2006/07                                                         | 3119 | 2858 | 2882 | 2897 | 3000 | 2843 | 3046 | 3560 | 4016 | 4048 | 3925 | 3645 | 4088   |
| 2007/08                                                         | 3150 | 2893 | 2922 | 2941 | 3046 | 2880 | 3078 | 3593 | 4056 | 4084 | 3960 | 3683 | 4126   |
| 2008/09                                                         | 3174 | 2921 | 2954 | 2978 | 3084 | 2909 | 3102 | 3617 | 4086 | 4110 | 3986 | 3711 | 4153   |
| 2009/10                                                         | 3198 | 2949 | 2987 | 3015 | 3122 | 2938 | 3125 | 3641 | 4115 | 4136 | 4012 | 3739 | 4180   |
| 2010/11                                                         | 3217 | 2972 | 3015 | 3047 | 3156 | 2964 | 3145 | 3660 | 4139 | 4156 | 4032 | 3762 | 4201   |
| 2011/12                                                         | 3241 | 3000 | 3048 | 3084 | 3194 | 2993 | 3169 | 3684 | 4168 | 4181 | 4057 | 3790 | 4228   |
| 2012/13                                                         | 3267 | 3031 | 3084 | 3124 | 3235 | 3026 | 3195 | 3711 | 4200 | 4209 | 4086 | 3821 | 4258   |
| 2013/14                                                         | 3298 | 3061 | 3114 | 3154 | 3266 | 3055 | 3226 | 3746 | 4238 | 4247 | 4123 | 3856 | 4296   |
| 2014/15                                                         | 3332 | 3092 | 3146 | 3187 | 3299 | 3087 | 3259 | 3783 | 4279 | 4288 | 4163 | 3894 | 4338   |
| 2015/16                                                         | 3366 | 3125 | 3179 | 3220 | 3333 | 3119 | 3293 | 3820 | 4321 | 4330 | 4204 | 3933 | 4380   |
| 2016/17                                                         | 3401 | 3157 | 3212 | 3253 | 3367 | 3152 | 3327 | 3858 | 4363 | 4372 | 4245 | 3972 | 4422   |
| 2017/18                                                         | 3435 | 3190 | 3245 | 3286 | 3402 | 3185 | 3361 | 3897 | 4405 | 4414 | 4286 | 4011 | 4465   |
| 2018/19                                                         | 3470 | 3223 | 3279 | 3320 | 3436 | 3218 | 3395 | 3935 | 4448 | 4457 | 4328 | 4051 | 4508   |
| 2019/20                                                         | 3509 | 3259 | 3316 | 3358 | 3475 | 3254 | 3433 | 3978 | 4495 | 4505 | 4374 | 4095 | 4556   |
| 2020/21                                                         | 3543 | 3292 | 3349 | 3391 | 3509 | 3287 | 3467 | 4016 | 4537 | 4547 | 4415 | 4134 | 4599   |
| 2021/22                                                         | 3581 | 3328 | 3385 | 3428 | 3547 | 3322 | 3505 | 4058 | 4584 | 4594 | 4461 | 4177 | 4646   |
| 2022/23                                                         | 3619 | 3363 | 3421 | 3464 | 3584 | 3358 | 3542 | 4100 | 4630 | 4640 | 4506 | 4219 | 4692   |
| 2023/24                                                         | 3649 | 3392 | 3450 | 3493 | 3614 | 3386 | 3571 | 4133 | 4667 | 4676 | 4542 | 4253 | 4730   |
| - See the Glossary of Terms for a definition of Net Total Peak. |      |      |      |      |      |      |      |      |      |      |      |      |        |

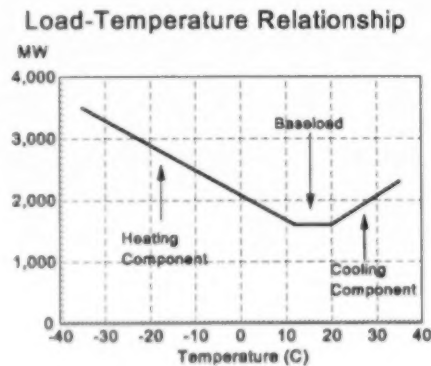


## HOURLY LOAD MODEL

The Hourly Load Model is designed to accurately estimate total electricity usage in Manitoba. Hourly system energy readings are related to the hour of day, day of week, month of year, and the current and past temperatures.

Figure 18

The adjacent graph illustrates the model's concepts. The base load is the temperature-insensitive part that varies by hour of day. The heating component is the additional load required as the temperature decreases. The cooling component is the additional load required as the temperature increases. The base load, heating coefficients and cooling coefficients are estimated from historical Net Total Generation data obtained from Energy Supply and Sales.



The Hourly Load Model predicts the hourly energy for every hour of each year. This is done for 25 different years of historical temperatures (from April 1978 to March 2003). In the first two years of the forecast, these 25 replications are summarized to get expected values and their standard deviations and represent the exact day-of-week pattern that will occur in these two years.

In the remaining years of the forecast, each of the 25 years of temperatures are combined with four day-of-week variations. These 100 replications are summarized to produce an average year. This smooths out the variation that would otherwise occur due to extra weekends in a month or leap years.

Output from the Hourly Load Model produces monthly energy distributions, monthly peaks, annual peaks, on-peak and off-peak energy splits, probabilities of peak occurrence, load duration curves, hourly load estimates and other types of information.

Table 15

| HISTORICAL NET FIRM ENERGY, NET TOTAL PEAK AND LOAD FACTOR                          |                           |       |                        |       |                  |
|-------------------------------------------------------------------------------------|---------------------------|-------|------------------------|-------|------------------|
| Fiscal Year                                                                         | Net Firm Energy<br>(GW.h) | %     | Net Total Peak<br>(MW) | %     | Load Factor<br>% |
| 1967/68                                                                             | 6062                      | 6.8%  | 1162                   | 11.1% | 59.6%            |
| 1968/69                                                                             | 6709                      | 10.7% | 1263                   | 8.7%  | 60.6%            |
| 1969/70                                                                             | 7517                      | 12.0% | 1409                   | 11.6% | 60.9%            |
| 1970/71                                                                             | 8313                      | 10.6% | 1551                   | 10.1% | 61.2%            |
| 1971/72                                                                             | 9080                      | 9.2%  | 1720                   | 10.9% | 60.3%            |
| 1972/73                                                                             | 9528                      | 4.9%  | 1785                   | 3.8%  | 60.9%            |
| 1973/74                                                                             | 10581                     | 11.1% | 1959                   | 9.7%  | 61.7%            |
| 1974/75                                                                             | 10872                     | 2.8%  | 1991                   | 1.6%  | 62.3%            |
| 1975/76                                                                             | 11432                     | 5.2%  | 2202                   | 10.6% | 59.3%            |
| 1976/77                                                                             | 11768                     | 2.9%  | 2350                   | 6.7%  | 57.2%            |
| 1977/78                                                                             | 11962                     | 1.6%  | 2446                   | 4.1%  | 55.8%            |
| 1978/79                                                                             | 12483                     | 4.4%  | 2405                   | -1.7% | 59.3%            |
| 1979/80                                                                             | 12797                     | 2.5%  | 2465                   | 2.5%  | 59.3%            |
| 1980/81                                                                             | 12529                     | -2.1% | 2536                   | 2.9%  | 56.4%            |
| 1981/82                                                                             | 13527                     | 8.0%  | 2713                   | 7.0%  | 56.9%            |
| 1982/83                                                                             | 13260                     | -2.0% | 2494                   | -8.1% | 60.7%            |
| 1983/84                                                                             | 14387                     | 8.5%  | 2875                   | 15.3% | 57.1%            |
| 1984/85                                                                             | 15014                     | 4.4%  | 2974                   | 3.4%  | 57.6%            |
| 1985/86                                                                             | 15366                     | 2.3%  | 2945                   | -1.0% | 59.6%            |
| 1986/87                                                                             | 15495                     | 0.8%  | 3003                   | 2.0%  | 58.9%            |
| 1987/88                                                                             | 16260                     | 4.9%  | 3326                   | 10.8% | 55.8%            |
| 1988/89                                                                             | 17108                     | 5.2%  | 3403                   | 2.3%  | 57.4%            |
| 1989/90                                                                             | 17298                     | 1.1%  | 3611                   | 6.1%  | 54.7%            |
| 1990/91                                                                             | 17553                     | 1.5%  | 3542                   | -1.9% | 56.6%            |
| 1991/92                                                                             | 17748                     | 1.1%  | 3435                   | -3.0% | 59.0%            |
| 1992/93                                                                             | 17894                     | 0.8%  | 3404                   | -0.9% | 60.0%            |
| 1993/94                                                                             | 18048                     | 0.9%  | 3567                   | 4.8%  | 57.8%            |
| 1994/95                                                                             | 17784                     | -1.5% | 3342                   | -6.3% | 60.7%            |
| 1995/96                                                                             | 19000                     | 6.8%  | 3647                   | 9.1%  | 59.5%            |
| 1996/97                                                                             | 19173                     | 0.9%  | 3476                   | -4.7% | 63.0%            |
| 1997/98                                                                             | 18872                     | -1.6% | 3573                   | 2.8%  | 60.3%            |
| 1998/99                                                                             | 19095                     | 1.2%  | 3639                   | 1.8%  | 59.9%            |
| 1999/00                                                                             | 18804                     | -1.5% | 3588                   | -1.4% | 59.8%            |
| 2000/01                                                                             | 20075                     | 6.8%  | 3708                   | 3.3%  | 61.8%            |
| 2001/02                                                                             | 20494                     | 2.1%  | 3760                   | 1.4%  | 62.2%            |
| 2002/03                                                                             | 21940                     | 7.1%  | 3916                   | 4.1%  | 64.0%            |
| - See the Glossary of Terms for a definition of Net Firm Energy and Net Total Peak. |                           |       |                        |       |                  |



## ALTERNATE SCENARIOS

A Medium-Low and Medium-High scenario have been prepared to represent the sensitivity of the forecast based on various economic and demographic assumptions. Each scenario represents a different version of future economic growth in Manitoba. Although any number of assumptions could be made, these two scenarios were chosen as being representative of Medium-Low and Medium-High economic growth.

When compared to the Base Forecast, the Medium-Low scenario includes lower population growth, lower housing formation rates, lower economic growth, lower oil and natural gas price increases, lower electric space heat saturation rates, lower business formation rates, lower business electricity usage, more shutdowns/closures of existing large customers and lower probabilities of large electrical-intensive industries locating in the province.

When compared to the Base Forecast, the Medium-High scenario includes higher population growth, higher housing formation rates, higher economic growth, higher oil and natural gas price increases, higher electric space heat saturation rates, higher business formation rates, higher business electricity usage, less shutdowns/closures of existing large customers and higher probabilities of large electrical-intensive industries locating in the province.

Table 16

| MEDIUM LOW SCENARIO<br>2002/03 - 2023/24                                            |                           |      |                        |       |                  |
|-------------------------------------------------------------------------------------|---------------------------|------|------------------------|-------|------------------|
| Fiscal Year                                                                         | Net Firm Energy<br>(GW.h) | %    | Net Total Peak<br>(MW) | %     | Load Factor<br>% |
| 2002/03 Actual                                                                      | 21940                     | 7.1% | 3916                   | 4.1%  | 64.0%            |
| Weather                                                                             | -272                      |      | 14                     |       |                  |
| 2002/03 Adjusted                                                                    | 21668                     | 4.5% | 3930                   | 4.3%  | 62.9%            |
| 2003/04                                                                             | 21725                     | 0.3% | 3891                   | -1.0% | 63.7%            |
| 2004/05                                                                             | 21934                     | 1.0% | 3920                   | 0.7%  | 63.9%            |
| 2005/06                                                                             | 22071                     | 0.6% | 3923                   | 0.1%  | 64.2%            |
| 2006/07                                                                             | 22193                     | 0.6% | 3935                   | 0.3%  | 64.4%            |
| 2007/08                                                                             | 22336                     | 0.6% | 3948                   | 0.3%  | 64.6%            |
| 2008/09                                                                             | 22453                     | 0.5% | 3959                   | 0.3%  | 64.7%            |
| 2009/10                                                                             | 22570                     | 0.5% | 3969                   | 0.3%  | 64.9%            |
| 2010/11                                                                             | 22680                     | 0.5% | 3978                   | 0.2%  | 65.1%            |
| 2011/12                                                                             | 22803                     | 0.5% | 3990                   | 0.3%  | 65.2%            |
| 2012/13                                                                             | 22927                     | 0.5% | 4002                   | 0.3%  | 65.4%            |
| 10 Year Avg.                                                                        |                           | 0.6% |                        | 0.2%  |                  |
| 2013/14                                                                             | 23040                     | 0.5% | 4020                   | 0.5%  | 65.4%            |
| 2014/15                                                                             | 23172                     | 0.6% | 4042                   | 0.5%  | 65.4%            |
| 2015/16                                                                             | 23325                     | 0.7% | 4067                   | 0.6%  | 65.5%            |
| 2016/17                                                                             | 23481                     | 0.7% | 4092                   | 0.6%  | 65.5%            |
| 2017/18                                                                             | 23638                     | 0.7% | 4117                   | 0.6%  | 65.5%            |
| 2018/19                                                                             | 23797                     | 0.7% | 4142                   | 0.6%  | 65.6%            |
| 2019/20                                                                             | 23957                     | 0.7% | 4168                   | 0.6%  | 65.6%            |
| 2020/21                                                                             | 24119                     | 0.7% | 4194                   | 0.6%  | 65.6%            |
| 2021/22                                                                             | 24283                     | 0.7% | 4220                   | 0.6%  | 65.7%            |
| 2022/23                                                                             | 24450                     | 0.7% | 4247                   | 0.6%  | 65.7%            |
| 2023/24                                                                             | 24618                     | 0.7% | 4274                   | 0.6%  | 65.8%            |
| 21 Year Avg.                                                                        |                           | 0.6% |                        | 0.4%  |                  |
| - See the Glossary of Terms for a definition of Net Firm Energy and Net Total Peak. |                           |      |                        |       |                  |

Table 17

| MONTHLY SCHEDULE OF NET FIRM ENERGY (GW.h)                       |      |      |      |      |      |      |      |      |      |      |      |      |       |
|------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Medium-Low Scenario                                              |      |      |      |      |      |      |      |      |      |      |      |      |       |
| Fiscal Year                                                      | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Total |
| 2002/03<br>Actual                                                | 1711 | 1615 | 1528 | 1603 | 1545 | 1527 | 1800 | 1950 | 2132 | 2321 | 2124 | 2084 | 21940 |
| 2003/04                                                          | 1649 | 1578 | 1522 | 1576 | 1606 | 1512 | 1702 | 1914 | 2251 | 2315 | 2067 | 2031 | 21725 |
| 2004/05                                                          | 1668 | 1594 | 1554 | 1594 | 1637 | 1533 | 1712 | 1944 | 2284 | 2340 | 2021 | 2054 | 21934 |
| 2005/06                                                          | 1676 | 1610 | 1563 | 1613 | 1652 | 1540 | 1726 | 1955 | 2287 | 2352 | 2030 | 2067 | 22071 |
| 2006/07                                                          | 1684 | 1620 | 1574 | 1627 | 1667 | 1550 | 1735 | 1963 | 2298 | 2361 | 2038 | 2077 | 22193 |
| 2007/08                                                          | 1693 | 1632 | 1587 | 1644 | 1683 | 1561 | 1745 | 1973 | 2310 | 2371 | 2048 | 2089 | 22336 |
| 2008/09                                                          | 1700 | 1642 | 1598 | 1659 | 1698 | 1570 | 1753 | 1981 | 2320 | 2378 | 2055 | 2099 | 22453 |
| 2009/10                                                          | 1708 | 1652 | 1609 | 1673 | 1712 | 1580 | 1760 | 1988 | 2330 | 2386 | 2062 | 2109 | 22570 |
| 2010/11                                                          | 1714 | 1661 | 1619 | 1687 | 1726 | 1588 | 1768 | 1996 | 2340 | 2393 | 2069 | 2118 | 22680 |
| 2011/12                                                          | 1722 | 1671 | 1631 | 1702 | 1741 | 1598 | 1776 | 2004 | 2350 | 2402 | 2077 | 2128 | 22803 |
| 2012/13                                                          | 1730 | 1681 | 1642 | 1717 | 1756 | 1608 | 1785 | 2013 | 2361 | 2410 | 2085 | 2139 | 22927 |
| 2013/14                                                          | 1739 | 1690 | 1650 | 1726 | 1764 | 1616 | 1794 | 2022 | 2373 | 2421 | 2095 | 2149 | 23040 |
| 2014/15                                                          | 1749 | 1700 | 1660 | 1736 | 1775 | 1626 | 1804 | 2034 | 2386 | 2435 | 2107 | 2162 | 23172 |
| 2015/16                                                          | 1760 | 1711 | 1671 | 1748 | 1787 | 1637 | 1816 | 2047 | 2401 | 2450 | 2120 | 2175 | 23325 |
| 2016/17                                                          | 1772 | 1723 | 1683 | 1760 | 1799 | 1648 | 1829 | 2061 | 2416 | 2466 | 2134 | 2190 | 23481 |
| 2017/18                                                          | 1785 | 1735 | 1695 | 1772 | 1811 | 1660 | 1841 | 2074 | 2432 | 2482 | 2148 | 2204 | 23638 |
| 2018/19                                                          | 1797 | 1747 | 1706 | 1784 | 1824 | 1671 | 1854 | 2088 | 2447 | 2498 | 2162 | 2219 | 23797 |
| 2019/20                                                          | 1809 | 1760 | 1718 | 1797 | 1836 | 1683 | 1867 | 2102 | 2463 | 2514 | 2176 | 2233 | 23957 |
| 2020/21                                                          | 1822 | 1772 | 1730 | 1809 | 1849 | 1695 | 1879 | 2116 | 2479 | 2530 | 2190 | 2248 | 24119 |
| 2021/22                                                          | 1834 | 1784 | 1742 | 1822 | 1862 | 1707 | 1892 | 2130 | 2495 | 2546 | 2204 | 2263 | 24283 |
| 2022/23                                                          | 1847 | 1797 | 1755 | 1835 | 1875 | 1719 | 1906 | 2144 | 2512 | 2563 | 2219 | 2278 | 24450 |
| 2023/24                                                          | 1860 | 1810 | 1767 | 1848 | 1888 | 1731 | 1919 | 2159 | 2529 | 2580 | 2234 | 2294 | 24618 |
| - See the Glossary of Terms for a definition of Net Firm Energy. |      |      |      |      |      |      |      |      |      |      |      |      |       |

Table 18

| MONTHLY SCHEDULE OF NET TOTAL PEAK (MW)<br>Medium-Low Scenario  |      |      |      |      |      |      |      |      |      |      |      |      |        |
|-----------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Fiscal Year                                                     | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Annual |
| 2002/03<br>Actual                                               | 3061 | 2794 | 2764 | 2894 | 2722 | 2681 | 3024 | 3365 | 3633 | 3816 | 3916 | 3796 | 3916   |
| 2003/04                                                         | 2940 | 2681 | 2682 | 2692 | 2784 | 2656 | 2863 | 3368 | 3807 | 3864 | 3728 | 3443 | 3891   |
| 2004/05                                                         | 2966 | 2697 | 2714 | 2720 | 2815 | 2688 | 2889 | 3396 | 3848 | 3875 | 3757 | 3488 | 3920   |
| 2005/06                                                         | 2976 | 2717 | 2736 | 2746 | 2845 | 2700 | 2904 | 3408 | 3850 | 3885 | 3764 | 3487 | 3923   |
| 2006/07                                                         | 2986 | 2732 | 2755 | 2769 | 2870 | 2716 | 2915 | 3418 | 3864 | 3895 | 3774 | 3501 | 3935   |
| 2007/08                                                         | 2999 | 2749 | 2777 | 2795 | 2897 | 2735 | 2928 | 3430 | 3880 | 3908 | 3787 | 3517 | 3948   |
| 2008/09                                                         | 3009 | 2763 | 2795 | 2818 | 2921 | 2751 | 2938 | 3439 | 3893 | 3917 | 3797 | 3530 | 3959   |
| 2009/10                                                         | 3019 | 2778 | 2815 | 2842 | 2945 | 2768 | 2949 | 3448 | 3906 | 3926 | 3806 | 3543 | 3969   |
| 2010/11                                                         | 3028 | 2791 | 2833 | 2864 | 2968 | 2783 | 2958 | 3456 | 3918 | 3934 | 3815 | 3554 | 3978   |
| 2011/12                                                         | 3038 | 2807 | 2853 | 2888 | 2993 | 2800 | 2969 | 3466 | 3932 | 3944 | 3825 | 3568 | 3990   |
| 2012/13                                                         | 3049 | 2822 | 2873 | 2912 | 3018 | 2818 | 2981 | 3476 | 3946 | 3955 | 3836 | 3582 | 4002   |
| 2013/14                                                         | 3064 | 2836 | 2887 | 2926 | 3033 | 2831 | 2995 | 3493 | 3965 | 3973 | 3854 | 3599 | 4020   |
| 2014/15                                                         | 3081 | 2852 | 2904 | 2942 | 3050 | 2847 | 3012 | 3512 | 3986 | 3995 | 3875 | 3619 | 4042   |
| 2015/16                                                         | 3101 | 2871 | 2923 | 2961 | 3069 | 2866 | 3031 | 3534 | 4010 | 4019 | 3899 | 3641 | 4067   |
| 2016/17                                                         | 3121 | 2890 | 2942 | 2981 | 3089 | 2885 | 3051 | 3556 | 4035 | 4044 | 3923 | 3664 | 4092   |
| 2017/18                                                         | 3141 | 2909 | 2961 | 3000 | 3109 | 2904 | 3071 | 3578 | 4060 | 4069 | 3947 | 3687 | 4117   |
| 2018/19                                                         | 3161 | 2928 | 2980 | 3020 | 3129 | 2923 | 3091 | 3601 | 4085 | 4094 | 3972 | 3710 | 4142   |
| 2019/20                                                         | 3182 | 2947 | 3000 | 3040 | 3150 | 2942 | 3111 | 3624 | 4110 | 4119 | 3996 | 3733 | 4168   |
| 2020/21                                                         | 3203 | 2967 | 3020 | 3060 | 3170 | 2962 | 3131 | 3647 | 4136 | 4145 | 4022 | 3757 | 4194   |
| 2021/22                                                         | 3224 | 2987 | 3040 | 3080 | 3191 | 2982 | 3152 | 3670 | 4162 | 4171 | 4047 | 3781 | 4220   |
| 2022/23                                                         | 3245 | 3007 | 3061 | 3101 | 3213 | 3002 | 3173 | 3694 | 4189 | 4198 | 4073 | 3806 | 4247   |
| 2023/24                                                         | 3267 | 3027 | 3081 | 3122 | 3234 | 3022 | 3194 | 3718 | 4215 | 4224 | 4099 | 3830 | 4274   |
| - See the Glossary of Terms for a definition of Net Total Peak. |      |      |      |      |      |      |      |      |      |      |      |      |        |

Table 19

| MEDIUM HIGH SCENARIO<br>2002/03 - 2023/24                                           |                           |      |                        |      |                  |
|-------------------------------------------------------------------------------------|---------------------------|------|------------------------|------|------------------|
| Fiscal Year                                                                         | Net Firm Energy<br>(GW.h) | %    | Net Total Peak<br>(MW) | %    | Load Factor<br>% |
| 2002/03 Actual                                                                      | 21940                     | 7.1% | 3916                   | 4.1% | 64.0%            |
| Weather                                                                             | -272                      |      | 14                     |      |                  |
| 2002/03 Adjusted                                                                    | 21668                     | 4.5% | 3930                   | 4.3% | 62.9%            |
| 2003/04                                                                             | 22564                     | 4.1% | 4012                   | 2.1% | 64.2%            |
| 2004/05                                                                             | 23131                     | 2.5% | 4094                   | 2.0% | 64.5%            |
| 2005/06                                                                             | 23663                     | 2.3% | 4155                   | 1.5% | 65.0%            |
| 2006/07                                                                             | 24141                     | 2.0% | 4218                   | 1.5% | 65.3%            |
| 2007/08                                                                             | 24582                     | 1.8% | 4277                   | 1.4% | 65.6%            |
| 2008/09                                                                             | 24983                     | 1.6% | 4329                   | 1.2% | 65.9%            |
| 2009/10                                                                             | 25384                     | 1.6% | 4382                   | 1.2% | 66.1%            |
| 2010/11                                                                             | 25752                     | 1.5% | 4428                   | 1.1% | 66.4%            |
| 2011/12                                                                             | 26154                     | 1.6% | 4481                   | 1.2% | 66.6%            |
| 2012/13                                                                             | 26568                     | 1.6% | 4535                   | 1.2% | 66.9%            |
| 10 Year Avg.                                                                        |                           | 2.1% |                        | 1.4% |                  |
| 2013/14                                                                             | 26953                     | 1.4% | 4595                   | 1.3% | 67.0%            |
| 2014/15                                                                             | 27360                     | 1.5% | 4660                   | 1.4% | 67.0%            |
| 2015/16                                                                             | 27794                     | 1.6% | 4728                   | 1.5% | 67.1%            |
| 2016/17                                                                             | 28201                     | 1.5% | 4792                   | 1.4% | 67.2%            |
| 2017/18                                                                             | 28634                     | 1.5% | 4861                   | 1.4% | 67.2%            |
| 2018/19                                                                             | 29067                     | 1.5% | 4930                   | 1.4% | 67.3%            |
| 2019/20                                                                             | 29540                     | 1.6% | 4989                   | 1.2% | 67.6%            |
| 2020/21                                                                             | 29850                     | 1.0% | 5052                   | 1.3% | 67.4%            |
| 2021/22                                                                             | 30256                     | 1.4% | 5116                   | 1.3% | 67.5%            |
| 2022/23                                                                             | 30695                     | 1.5% | 5186                   | 1.4% | 67.6%            |
| 2023/24                                                                             | 31140                     | 1.5% | 5257                   | 1.4% | 67.6%            |
| 21 Year Avg.                                                                        |                           | 1.7% |                        | 1.4% |                  |
| - See the Glossary of Terms for a definition of Net Firm Energy and Net Total Peak. |                           |      |                        |      |                  |

Table 20

| MONTHLY SCHEDULE OF NET FIRM ENERGY (GW.h)                       |      |      |      |      |      |      |      |      |      |      |      |      |       |
|------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Medium-High Scenario                                             |      |      |      |      |      |      |      |      |      |      |      |      |       |
| Fiscal Year                                                      | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Total |
| 2002/03 Actual                                                   | 1711 | 1615 | 1528 | 1603 | 1545 | 1527 | 1800 | 1950 | 2132 | 2321 | 2124 | 2084 | 21940 |
| 2003/04                                                          | 1716 | 1644 | 1586 | 1643 | 1673 | 1576 | 1771 | 1985 | 2329 | 2395 | 2140 | 2106 | 22564 |
| 2004/05                                                          | 1763 | 1689 | 1646 | 1689 | 1733 | 1624 | 1810 | 2046 | 2397 | 2454 | 2121 | 2161 | 23131 |
| 2005/06                                                          | 1802 | 1736 | 1685 | 1739 | 1779 | 1661 | 1856 | 2090 | 2437 | 2504 | 2164 | 2209 | 23663 |
| 2006/07                                                          | 1838 | 1774 | 1723 | 1782 | 1823 | 1698 | 1894 | 2129 | 2481 | 2547 | 2202 | 2251 | 24141 |
| 2007/08                                                          | 1870 | 1809 | 1759 | 1822 | 1863 | 1731 | 1928 | 2164 | 2522 | 2586 | 2237 | 2290 | 24582 |
| 2008/09                                                          | 1900 | 1841 | 1791 | 1859 | 1900 | 1762 | 1958 | 2197 | 2559 | 2621 | 2269 | 2325 | 24983 |
| 2009/10                                                          | 1929 | 1873 | 1824 | 1896 | 1938 | 1793 | 1989 | 2229 | 2597 | 2656 | 2300 | 2361 | 25384 |
| 2010/11                                                          | 1956 | 1903 | 1854 | 1931 | 1973 | 1821 | 2018 | 2258 | 2630 | 2687 | 2328 | 2393 | 25752 |
| 2011/12                                                          | 1985 | 1935 | 1887 | 1968 | 2010 | 1852 | 2048 | 2290 | 2667 | 2722 | 2360 | 2428 | 26154 |
| 2012/13                                                          | 2016 | 1968 | 1921 | 2007 | 2049 | 1884 | 2080 | 2323 | 2706 | 2759 | 2392 | 2465 | 26568 |
| 2013/14                                                          | 2046 | 1998 | 1949 | 2037 | 2079 | 1912 | 2111 | 2356 | 2743 | 2797 | 2426 | 2499 | 26953 |
| 2014/15                                                          | 2077 | 2029 | 1980 | 2068 | 2111 | 1942 | 2144 | 2391 | 2783 | 2837 | 2461 | 2536 | 27360 |
| 2015/16                                                          | 2111 | 2062 | 2012 | 2102 | 2145 | 1974 | 2178 | 2428 | 2826 | 2880 | 2499 | 2576 | 27794 |
| 2016/17                                                          | 2142 | 2093 | 2043 | 2134 | 2177 | 2004 | 2211 | 2464 | 2866 | 2921 | 2534 | 2613 | 28201 |
| 2017/18                                                          | 2176 | 2126 | 2075 | 2167 | 2212 | 2036 | 2245 | 2501 | 2908 | 2964 | 2572 | 2652 | 28634 |
| 2018/19                                                          | 2209 | 2159 | 2107 | 2201 | 2246 | 2068 | 2280 | 2538 | 2951 | 3007 | 2610 | 2692 | 29067 |
| 2019/20                                                          | 2239 | 2189 | 2136 | 2231 | 2276 | 2096 | 2311 | 2571 | 2988 | 3045 | 2643 | 2727 | 29450 |
| 2020/21                                                          | 2270 | 2219 | 2166 | 2262 | 2308 | 2125 | 2342 | 2606 | 3027 | 3085 | 2678 | 2763 | 29850 |
| 2021/22                                                          | 2301 | 2251 | 2196 | 2293 | 2340 | 2155 | 2375 | 2641 | 3067 | 3125 | 2713 | 2800 | 30256 |
| 2022/23                                                          | 2335 | 2284 | 2228 | 2327 | 2374 | 2187 | 2410 | 2679 | 3110 | 3169 | 2751 | 2840 | 30695 |
| 2023/24                                                          | 2369 | 2318 | 2262 | 2362 | 2409 | 2220 | 2445 | 2717 | 3154 | 3214 | 2790 | 2880 | 31140 |
| - See the Glossary of Terms for a definition of Net Firm Energy. |      |      |      |      |      |      |      |      |      |      |      |      |       |



Table 21

| MONTHLY SCHEDULE OF NET TOTAL PEAK (MW)<br>Medium-High Scenario |      |      |      |      |      |      |      |      |      |      |      |      |        |
|-----------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Fiscal<br>Year                                                  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Jan  | Feb  | Mar  | Annual |
| 2002/03<br>Actual                                               | 3061 | 2794 | 2764 | 2894 | 2722 | 2681 | 3024 | 3365 | 3633 | 3816 | 3916 | 3796 | 3916   |
| 2003/04                                                         | 3044 | 2780 | 2781 | 2791 | 2885 | 2754 | 2965 | 3479 | 3926 | 3984 | 3846 | 3556 | 4012   |
| 2004/05                                                         | 3115 | 2839 | 2856 | 2862 | 2959 | 2830 | 3036 | 3557 | 4021 | 4048 | 3926 | 3650 | 4094   |
| 2005/06                                                         | 3174 | 2905 | 2925 | 2936 | 3039 | 2888 | 3099 | 3621 | 4079 | 4115 | 3989 | 3703 | 4155   |
| 2006/07                                                         | 3228 | 2963 | 2987 | 3002 | 3107 | 2947 | 3154 | 3678 | 4144 | 4177 | 4051 | 3766 | 4218   |
| 2007/08                                                         | 3279 | 3016 | 3045 | 3065 | 3172 | 3001 | 3204 | 3732 | 4206 | 4234 | 4108 | 3824 | 4277   |
| 2008/09                                                         | 3324 | 3064 | 3098 | 3122 | 3231 | 3051 | 3249 | 3779 | 4260 | 4285 | 4158 | 3875 | 4329   |
| 2009/10                                                         | 3369 | 3112 | 3151 | 3180 | 3291 | 3101 | 3294 | 3826 | 4315 | 4336 | 4208 | 3927 | 4382   |
| 2010/11                                                         | 3410 | 3156 | 3201 | 3234 | 3346 | 3148 | 3335 | 3868 | 4364 | 4381 | 4253 | 3974 | 4428   |
| 2011/12                                                         | 3455 | 3205 | 3255 | 3292 | 3406 | 3198 | 3380 | 3916 | 4418 | 4431 | 4303 | 4026 | 4481   |
| 2012/13                                                         | 3502 | 3256 | 3311 | 3352 | 3468 | 3250 | 3427 | 3965 | 4475 | 4484 | 4356 | 4080 | 4535   |
| 2013/14                                                         | 3551 | 3302 | 3358 | 3400 | 3517 | 3297 | 3475 | 4019 | 4535 | 4544 | 4414 | 4135 | 4595   |
| 2014/15                                                         | 3603 | 3351 | 3408 | 3450 | 3568 | 3346 | 3527 | 4076 | 4598 | 4607 | 4476 | 4194 | 4660   |
| 2015/16                                                         | 3658 | 3403 | 3461 | 3504 | 3623 | 3398 | 3581 | 4138 | 4666 | 4676 | 4542 | 4257 | 4728   |
| 2016/17                                                         | 3710 | 3452 | 3510 | 3554 | 3675 | 3447 | 3632 | 4195 | 4729 | 4739 | 4604 | 4315 | 4792   |
| 2017/18                                                         | 3766 | 3505 | 3563 | 3607 | 3730 | 3499 | 3687 | 4256 | 4797 | 4807 | 4671 | 4378 | 4861   |
| 2018/19                                                         | 3821 | 3557 | 3616 | 3661 | 3785 | 3551 | 3741 | 4318 | 4865 | 4875 | 4737 | 4441 | 4930   |
| 2019/20                                                         | 3870 | 3603 | 3663 | 3708 | 3833 | 3597 | 3789 | 4372 | 4924 | 4934 | 4795 | 4496 | 4989   |
| 2020/21                                                         | 3921 | 3651 | 3712 | 3757 | 3884 | 3646 | 3839 | 4428 | 4986 | 4997 | 4856 | 4554 | 5052   |
| 2021/22                                                         | 3973 | 3700 | 3762 | 3807 | 3935 | 3694 | 3890 | 4485 | 5050 | 5060 | 4917 | 4612 | 5116   |
| 2022/23                                                         | 4029 | 3753 | 3815 | 3862 | 3991 | 3747 | 3945 | 4547 | 5119 | 5129 | 4985 | 4676 | 5186   |
| 2023/24                                                         | 4086 | 3807 | 3870 | 3917 | 4048 | 3801 | 4002 | 4610 | 5188 | 5199 | 5053 | 4741 | 5257   |
| - See the Glossary of Terms for a definition of Net Total Peak. |      |      |      |      |      |      |      |      |      |      |      |      |        |

## LOAD FORECAST UNCERTAINTY

The Medium-Low and Medium-High scenarios represent the expected forecast of loads given a set of specified economic conditions that correspond to assumptions of lower and higher economic growth. However, these scenarios do not imply a likelihood of occurrence. To establish these likelihoods (and for other probabilistic or risk analysis purposes), the following estimates of the variation in the forecast are provided. The variation in the forecast is divided into two parts:

1) **Weather and Random Variation** - is the variation caused by above or below normal temperatures, or by increased or decreased short-term consumption by groups of customers or industries. This variation is determined from the Hourly Load Model.

2) **Economic and Modelling Variation** - is the variation due to changes in economic conditions and modelling assumptions. This variation is obtained by taking the historical weather-adjusted annual energy and determining the year-to-year variation in its growth. A statistically-based method of estimating the year-to-year variation has been used this year, resulting in a lower estimate of future economic and modelling variation. This change has lowered the probability of exceeding either the Medium-Low or Medium-High scenarios.

The two variations are combined to determine the total uncertainty of the forecast. These are converted to a statistical measure known as a standard deviation. The future load is expected to be within one standard deviation of the Base Forecast 68% of the time and within three standard deviations of the Base Forecast 99% of the time.



Figure 19

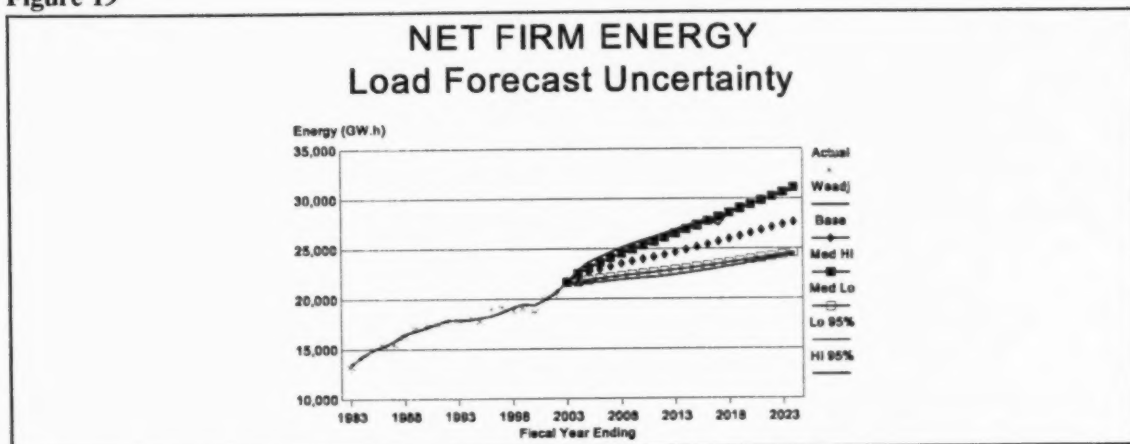


Table 22

| Fiscal Year | Net Firm Energy Base Fcst | Wthr and Misc Std Dev | Econ and Model Std Dev | Total Std Dev | 95% Lower Conf. Intrvl. (LCL) | Net Firm Energy MedLo Scenario | Net Firm Energy MedHi Scenario | 95% Upper Conf. Intrvl. (UCL) | Prob. Actual > MedLo | Prob. Actual > MedHi |
|-------------|---------------------------|-----------------------|------------------------|---------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|----------------------|----------------------|
| 2003/04     | 22171                     | 246                   | 275                    | 369           | 21448                         | 21725                          | 22564                          | 22894                         | 89%                  | 14%                  |
| 2004/05     | 22690                     | 247                   | 452                    | 515           | 21680                         | 21934                          | 23131                          | 23700                         | 93%                  | 20%                  |
| 2005/06     | 22976                     | 244                   | 578                    | 627           | 21747                         | 22071                          | 23663                          | 24206                         | 93%                  | 14%                  |
| 2006/07     | 23262                     | 245                   | 680                    | 723           | 21844                         | 22193                          | 24141                          | 24679                         | 93%                  | 11%                  |
| 2007/08     | 23554                     | 246                   | 770                    | 808           | 21970                         | 22336                          | 24582                          | 25137                         | 93%                  | 10%                  |
| 2008/09     | 23783                     | 247                   | 849                    | 885           | 22049                         | 22453                          | 24983                          | 25517                         | 93%                  | 9%                   |
| 2009/10     | 24009                     | 247                   | 922                    | 955           | 22138                         | 22570                          | 25384                          | 25881                         | 93%                  | 8%                   |
| 2010/11     | 24203                     | 247                   | 990                    | 1020          | 22203                         | 22680                          | 25753                          | 26202                         | 93%                  | 6%                   |
| 2011/12     | 24430                     | 248                   | 1053                   | 1082          | 22309                         | 22803                          | 26154                          | 26550                         | 93%                  | 6%                   |
| 2012/13     | 24680                     | 249                   | 1113                   | 1140          | 22445                         | 22927                          | 26568                          | 26915                         | 94%                  | 5%                   |
| 2013/14     | 24927                     | 250                   | 1169                   | 1196          | 22583                         | 23040                          | 26953                          | 27271                         | 94%                  | 5%                   |
| 2014/15     | 25191                     | 252                   | 1223                   | 1249          | 22743                         | 23172                          | 27360                          | 27639                         | 95%                  | 4%                   |
| 2015/16     | 25458                     | 254                   | 1275                   | 1300          | 22910                         | 23325                          | 27794                          | 28006                         | 95%                  | 4%                   |
| 2016/17     | 25729                     | 256                   | 1325                   | 1349          | 23084                         | 23481                          | 28201                          | 28374                         | 95%                  | 3%                   |
| 2017/18     | 26001                     | 258                   | 1373                   | 1397          | 23263                         | 23638                          | 28634                          | 28739                         | 96%                  | 3%                   |
| 2018/19     | 26274                     | 260                   | 1419                   | 1443          | 23446                         | 23797                          | 29067                          | 29101                         | 96%                  | 3%                   |
| 2019/20     | 26576                     | 263                   | 1464                   | 1487          | 23661                         | 23957                          | 29450                          | 29491                         | 96%                  | 3%                   |
| 2020/21     | 26847                     | 265                   | 1507                   | 1530          | 23847                         | 24119                          | 29850                          | 29847                         | 96%                  | 3%                   |
| 2021/22     | 27143                     | 267                   | 1550                   | 1572          | 24061                         | 24283                          | 30256                          | 30225                         | 97%                  | 2%                   |
| 2022/23     | 27436                     | 269                   | 1591                   | 1613          | 24274                         | 24450                          | 30695                          | 30598                         | 97%                  | 2%                   |
| 2023/24     | 27675                     | 271                   | 1631                   | 1653          | 24435                         | 24618                          | 31140                          | 30915                         | 97%                  | 2%                   |

Figure 20

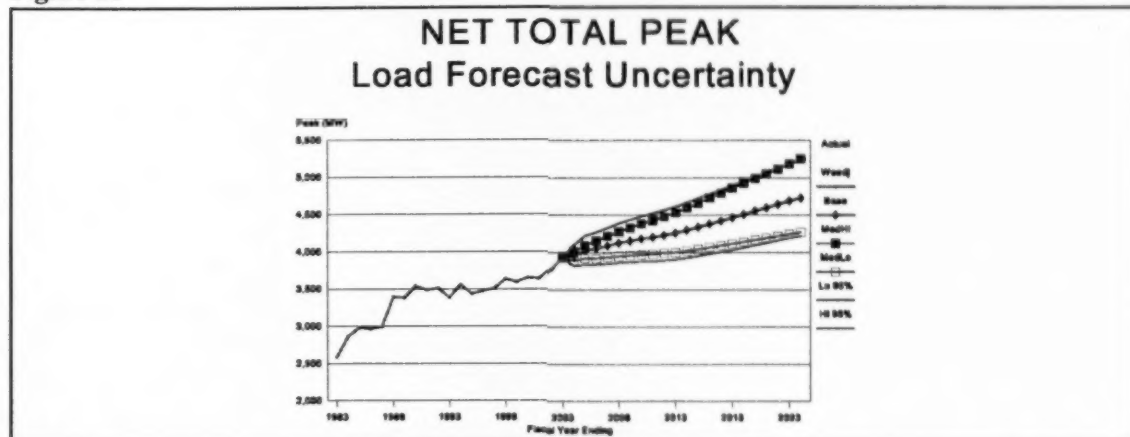


Table 23

| Fiscal Year | Net Total Peak Base Fcst | Wthr and Misc Std Dev | Econ and Model Std Dev | Total Std Dev | 95% Lower Conf. Intrvl. (LCL) | Net Total Peak MedLo Scenario | Net Total Peak MedHi Scenario | 95% Upper Conf. Intrvl. (UCL) | Prob. Actual > MedLo | Prob. Actual > MedHi |
|-------------|--------------------------|-----------------------|------------------------|---------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------------|----------------------|
| 2003/04     | 3956                     | 58                    | 40                     | 70            | 3818                          | 3891                          | 4012                          | 4094                          | 82%                  | 21%                  |
| 2004/05     | 4028                     | 73                    | 66                     | 98            | 3835                          | 3920                          | 4094                          | 4221                          | 86%                  | 25%                  |
| 2005/06     | 4053                     | 71                    | 84                     | 110           | 3837                          | 3923                          | 4155                          | 4269                          | 88%                  | 18%                  |
| 2006/07     | 4088                     | 72                    | 99                     | 122           | 3848                          | 3935                          | 4218                          | 4328                          | 90%                  | 14%                  |
| 2007/08     | 4126                     | 73                    | 113                    | 134           | 3863                          | 3948                          | 4277                          | 4389                          | 91%                  | 13%                  |
| 2008/09     | 4153                     | 74                    | 124                    | 145           | 3870                          | 3959                          | 4329                          | 4436                          | 91%                  | 11%                  |
| 2009/10     | 4180                     | 74                    | 135                    | 154           | 3878                          | 3969                          | 4382                          | 4482                          | 91%                  | 10%                  |
| 2010/11     | 4201                     | 75                    | 145                    | 163           | 3881                          | 3978                          | 4428                          | 4521                          | 91%                  | 8%                   |
| 2011/12     | 4228                     | 76                    | 154                    | 172           | 3891                          | 3990                          | 4481                          | 4565                          | 92%                  | 7%                   |
| 2012/13     | 4258                     | 76                    | 163                    | 180           | 3906                          | 4002                          | 4535                          | 4610                          | 92%                  | 6%                   |
| 2013/14     | 4296                     | 77                    | 172                    | 188           | 3927                          | 4020                          | 4595                          | 4665                          | 93%                  | 6%                   |
| 2014/15     | 4338                     | 77                    | 181                    | 196           | 3953                          | 4042                          | 4660                          | 4723                          | 93%                  | 5%                   |
| 2015/16     | 4380                     | 78                    | 189                    | 204           | 3980                          | 4067                          | 4728                          | 4780                          | 94%                  | 4%                   |
| 2016/17     | 4422                     | 79                    | 196                    | 212           | 4007                          | 4092                          | 4792                          | 4837                          | 94%                  | 4%                   |
| 2017/18     | 4465                     | 79                    | 204                    | 219           | 4035                          | 4117                          | 4861                          | 4895                          | 94%                  | 4%                   |
| 2018/19     | 4508                     | 80                    | 212                    | 227           | 4064                          | 4142                          | 4930                          | 4952                          | 95%                  | 3%                   |
| 2019/20     | 4556                     | 81                    | 219                    | 233           | 4099                          | 4168                          | 4989                          | 5013                          | 95%                  | 3%                   |
| 2020/21     | 4599                     | 81                    | 226                    | 240           | 4129                          | 4194                          | 5052                          | 5069                          | 95%                  | 3%                   |
| 2021/22     | 4646                     | 82                    | 232                    | 246           | 4163                          | 4220                          | 5116                          | 5129                          | 96%                  | 3%                   |
| 2022/23     | 4692                     | 83                    | 239                    | 253           | 4196                          | 4247                          | 5186                          | 5188                          | 96%                  | 3%                   |
| 2023/24     | 4730                     | 83                    | 246                    | 259           | 4222                          | 4274                          | 5257                          | 5238                          | 96%                  | 2%                   |

## FORECAST ACCURACY

Comparing previous load forecast to actual results has been complicated by changes in utility operations and reporting. Five major changes have occurred since 1990. Each of these changes will be discussed briefly.

**1) Interruptible Sales** - Since 1991/92, Manitoba Hydro has offered interruptible rates to its customers. These rates have created a distinction between firm and non-firm sales, which affect the calculation of Net Firm Energy because non-firm sales are excluded.

**2) Demand Side Management** - Since 1992/93, Manitoba Hydro has included Demand Side Management (DSM) as a supply side resource in the determination of System Capability and Energy Requirement. The load forecast contains DSM associated with the Basic Customer Information and Service option. The forecast includes savings from appliance efficiency improvements and other base DSM program. It does not include incentive-based DSM programs. These are reviewed as a supply-side resource that can be ramped up or down dependant on future need.

**3) Curtailable Rates** - Since 1993/94, Manitoba Hydro has offered a curtailable rate program to its customers. These rates affect the actual peak load experienced because customers are usually curtailed at the time of peak. When calculating the Net Total Peak for this report, the curtailments are added back to create a consistent hourly integrated load profile. The transformed hourly load data is used in the Hourly Load Model.

**4) Station Service** - Since 1993/94, transmission losses and station service have been metered separately at the generation stations. Previously, transmission losses and station service were indistinguishable and recorded under transmission losses. The separation of transmission losses and station service affect the calculation of Net Firm Energy because station services losses are excluded.

**5) Peak Definition** - Since 1993/94, Manitoba Hydro has defined the system peak as an hourly integrated value. Previously, the peak was recorded as an instantaneous or one minute peak.

Depending on when the forecast was created, adjustments have been made to the forecasted energy and peak values to account for these variances. This will present a more meaningful analysis of the long term forecast accuracy.

Figure 21

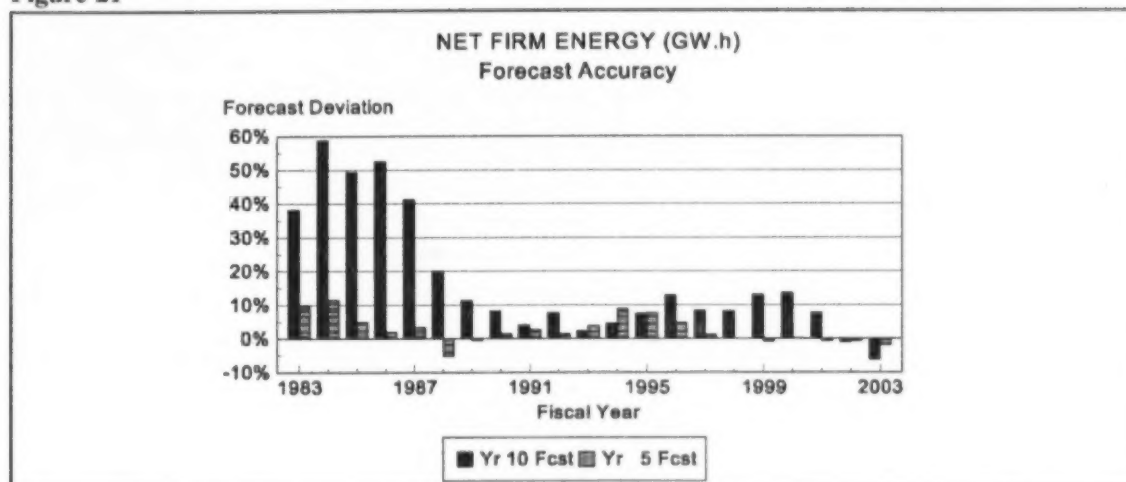


Table 24

| Fiscal Year | Forecast Prepared 10 Years Previous | Forecast Prepared 5 Years Previous | Actual Net Firm Energy | Weather Adjustment | Weadj. Net Firm Energy | 10 Year Percent Deviation | 5 Year Percent Deviation |
|-------------|-------------------------------------|------------------------------------|------------------------|--------------------|------------------------|---------------------------|--------------------------|
| 1982/83     | 18633                               | 14778                              | 13260                  | 212                | 13472                  | 38.3%                     | 9.7%                     |
| 1983/84     | 22587                               | 15868                              | 14387                  | -155               | 14232                  | 58.7%                     | 11.5%                    |
| 1984/85     | 22332                               | 15679                              | 15014                  | -62                | 14952                  | 49.4%                     | 4.9%                     |
| 1985/86     | 23339                               | 15600                              | 15366                  | -53                | 15313                  | 52.4%                     | 1.9%                     |
| 1986/87     | 22325                               | 16333                              | 15495                  | 313                | 15808                  | 41.2%                     | 3.3%                     |
| 1987/88     | 19823                               | 15692                              | 16260                  | 276                | 16536                  | 19.9%                     | -5.1%                    |
| 1988/89     | 18751                               | 16753                              | 17108                  | -263               | 16845                  | 11.3%                     | -0.5%                    |
| 1989/90     | 18585                               | 17451                              | 17298                  | -104               | 17194                  | 8.1%                      | 1.5%                     |
| 1990/91     | 18254                               | 17994                              | 17553                  | -7                 | 17546                  | 4.0%                      | 2.6%                     |
| 1991/92     | 19311                               | 18166                              | 17748                  | 176                | 17924                  | 7.7%                      | 1.4%                     |
| 1992/93     | 18312                               | 18592                              | 17894                  | 2                  | 17896                  | 2.3%                      | 3.9%                     |
| 1993/94     | 18773                               | 19539                              | 18048                  | -95                | 17953                  | 4.6%                      | 8.8%                     |
| 1994/95     | 19508                               | 19551                              | 17784                  | 363                | 18147                  | 7.5%                      | 7.7%                     |
| 1995/96     | 20659                               | 19194                              | 19000                  | -689               | 18311                  | 12.8%                     | 4.8%                     |
| 1996/97     | 20229                               | 18913                              | 19173                  | -491               | 18682                  | 8.3%                      | 1.2%                     |
| 1997/98     | 20737                               | 19186                              | 18872                  | 296                | 19168                  | 8.2%                      | 0.1%                     |
| 1998/99     | 22059                               | 19345                              | 19095                  | 411                | 19506                  | 13.1%                     | -0.8%                    |
| 1999/00     | 22018                               | 19425                              | 18804                  | 592                | 19396                  | 13.5%                     | 0.2%                     |
| 2000/01     | 21502                               | 19829                              | 20075                  | -106               | 19969                  | 7.7%                      | -0.7%                    |
| 2001/02     | 20482                               | 20542                              | 20494                  | 202                | 20696                  | -1.0%                     | -0.7%                    |
| 2002/03     | 20299                               | 21252                              | 21940                  | -272               | 21668                  | -6.3%                     | -1.9%                    |

Figure 22

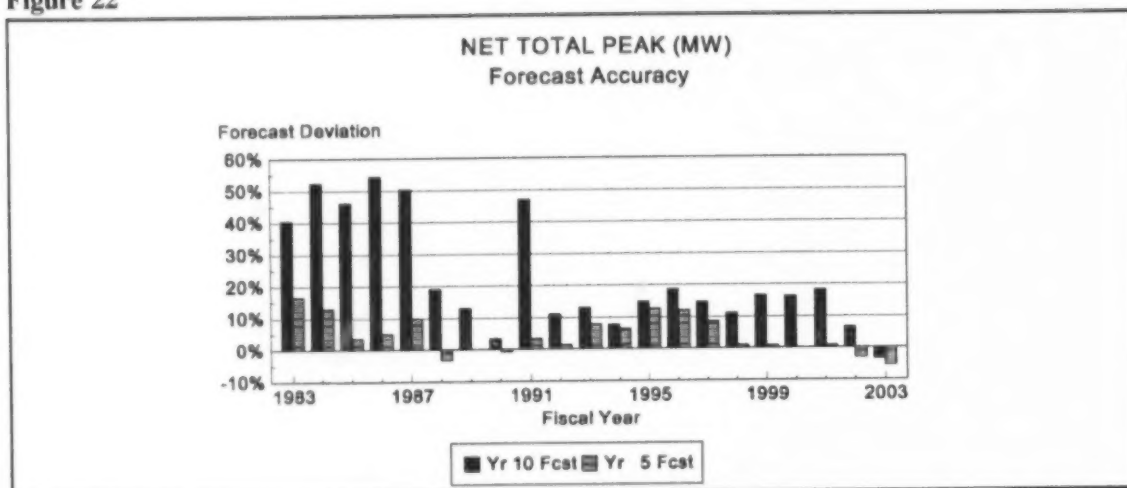


Table 25

| Fiscal Year | Forecast Prepared 10 Years Previous | Forecast Prepared 5 Years Previous | Actual Net Total Peak | Curtailed and Weather Adjustment | Weadj. Net Total Peak | 10 Year Percent Deviation | 5 Year Percent Deviation |
|-------------|-------------------------------------|------------------------------------|-----------------------|----------------------------------|-----------------------|---------------------------|--------------------------|
| 1982/83     | 3632                                | 3013                               | 2494                  | 91                               | 2585                  | 40.5%                     | 16.6%                    |
| 1983/84     | 4361                                | 3234                               | 2875                  | -12                              | 2863                  | 52.3%                     | 13.0%                    |
| 1984/85     | 4356                                | 3087                               | 2974                  | 8                                | 2982                  | 46.1%                     | 3.5%                     |
| 1985/86     | 4584                                | 3119                               | 2945                  | 23                               | 2968                  | 54.4%                     | 5.1%                     |
| 1986/87     | 4506                                | 3293                               | 3003                  | -5                               | 2998                  | 50.3%                     | 9.8%                     |
| 1987/88     | 4041                                | 3286                               | 3326                  | 67                               | 3393                  | 19.1%                     | -3.2%                    |
| 1988/89     | 3822                                | 3384                               | 3403                  | -19                              | 3384                  | 12.9%                     | 0.0%                     |
| 1989/90     | 3659                                | 3515                               | 3611                  | -71                              | 3540                  | 3.4%                      | -0.7%                    |
| 1990/91     | 3652                                | 3603                               | 3542                  | -53                              | 3489                  | 4.7%                      | 3.3%                     |
| 1991/92     | 3896                                | 3557                               | 3435                  | 74                               | 3509                  | 11.0%                     | 1.4%                     |
| 1992/93     | 3809                                | 3631                               | 3404                  | -34                              | 3370                  | 13.0%                     | 7.7%                     |
| 1993/94     | 3816                                | 3771                               | 3567                  | -22                              | 3545                  | 7.6%                      | 6.4%                     |
| 1994/95     | 3930                                | 3855                               | 3342                  | 82                               | 3424                  | 14.8%                     | 12.6%                    |
| 1995/96     | 4115                                | 3884                               | 3647                  | -181                             | 3466                  | 18.7%                     | 12.1%                    |
| 1996/97     | 4003                                | 3796                               | 3476                  | 19                               | 3495                  | 14.5%                     | 8.6%                     |
| 1997/98     | 4036                                | 3670                               | 3573                  | 60                               | 3633                  | 11.1%                     | 1.0%                     |
| 1998/99     | 4194                                | 3623                               | 3639                  | -46                              | 3593                  | 16.7%                     | 0.8%                     |
| 1999/00     | 4243                                | 3652                               | 3588                  | 61                               | 3649                  | 16.3%                     | 0.1%                     |
| 2000/01     | 4303                                | 3669                               | 3708                  | -71                              | 3637                  | 18.3%                     | 0.9%                     |
| 2001/02     | 4019                                | 3657                               | 3760                  | 9                                | 3769                  | 6.6%                      | -3.0%                    |
| 2002/03     | 3798                                | 3717                               | 3916                  | 14                               | 3930                  | -3.4%                     | -5.4%                    |

## CALENDAR YEAR RESULTS

Table 26

| ENERGY SALES TO MANITOBA HYDRO CUSTOMERS |             |                    |                               |                                        |      |                 |                                        |
|------------------------------------------|-------------|--------------------|-------------------------------|----------------------------------------|------|-----------------|----------------------------------------|
| <u>2002-2023 (GW.h)</u>                  |             |                    |                               |                                        |      |                 |                                        |
| Base Forecast                            |             |                    |                               |                                        |      |                 |                                        |
| Calendar<br>Year                         | Residential | General<br>Service | Area &<br>Roadway<br>Lighting | Manitoba<br>Hydro Sales<br>Incl Diesel |      | Total<br>Diesel | Manitoba<br>Hydro Sales<br>Excl Diesel |
| 2002<br>Actual                           | 6145        | 12581              | 89                            | 18815                                  | 5.5% | 10              | 18805                                  |
| 2003                                     | 6207        | 12948              | 90                            | 19245                                  | 2.3% | 11              | 19234                                  |
| 2004                                     | 6176        | 13411              | 91                            | 19679                                  | 2.3% | 12              | 19667                                  |
| 2005                                     | 6216        | 13718              | 92                            | 20026                                  | 1.8% | 13              | 20013                                  |
| 2006                                     | 6255        | 13875              | 92                            | 20222                                  | 1.0% | 14              | 20208                                  |
| 2007                                     | 6295        | 14065              | 93                            | 20454                                  | 1.1% | 14              | 20440                                  |
| 2008                                     | 6335        | 14233              | 94                            | 20662                                  | 1.0% | 15              | 20647                                  |
| 2009                                     | 6375        | 14392              | 95                            | 20861                                  | 1.0% | 16              | 20845                                  |
| 2010                                     | 6415        | 14550              | 95                            | 21060                                  | 1.0% | 17              | 21043                                  |
| 2011                                     | 6455        | 14715              | 96                            | 21267                                  | 1.0% | 18              | 21249                                  |
| 2012                                     | 6496        | 14890              | 97                            | 21484                                  | 1.0% | 19              | 21465                                  |
| 2013                                     | 6538        | 15066              | 98                            | 21701                                  | 1.0% | 19              | 21682                                  |
| 2014                                     | 6581        | 15248              | 98                            | 21928                                  | 1.0% | 20              | 21908                                  |
| 2015                                     | 6624        | 15436              | 99                            | 22159                                  | 1.1% | 21              | 22138                                  |
| 2016                                     | 6666        | 15624              | 100                           | 22390                                  | 1.0% | 22              | 22368                                  |
| 2017                                     | 6710        | 15813              | 101                           | 22624                                  | 1.0% | 23              | 22601                                  |
| 2018                                     | 6754        | 16002              | 102                           | 22858                                  | 1.0% | 23              | 22835                                  |
| 2019                                     | 6799        | 16192              | 102                           | 23093                                  | 1.0% | 24              | 23069                                  |
| 2020                                     | 6845        | 16382              | 103                           | 23330                                  | 1.0% | 25              | 23305                                  |
| 2021                                     | 6892        | 16573              | 104                           | 23569                                  | 1.0% | 25              | 23544                                  |
| 2022                                     | 6941        | 16765              | 105                           | 23810                                  | 1.0% | 26              | 23784                                  |
| 2023                                     | 6991        | 16958              | 105                           | 24054                                  | 1.0% | 26              | 24028                                  |



Table 27

| NET FIRM ENERGY<br>2002 - 2023 (GW.h)<br>Base Forecast                                                                    |              |              |                             |                             |                    |                 |                 |                 |
|---------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-----------------------------|-----------------------------|--------------------|-----------------|-----------------|-----------------|
| Calendar Year                                                                                                             | Dist. Losses | Const. Power | Manitoba Load at Common Bus | Trans. Losses & Stn Service | Gross Total Energy | Non Firm Energy | Station Service | Net Firm Energy |
| 2002 Actual                                                                                                               | 709          | 45           | 19560                       | 2153                        | 21713              | 29              | 170             | 21514           |
| 2003                                                                                                                      | 956          | 46           | 20236                       | 2128                        | 22364              | 28              | 171             | 22165           |
| 2004                                                                                                                      | 931          | 45           | 20643                       | 2177                        | 22819              | 35              | 176             | 22609           |
| 2005                                                                                                                      | 829          | 45           | 20888                       | 2204                        | 23092              | 13              | 178             | 22901           |
| 2006                                                                                                                      | 881          | 51           | 21142                       | 2230                        | 23372              | 0               | 181             | 23191           |
| 2007                                                                                                                      | 893          | 74           | 21406                       | 2258                        | 23664              | 0               | 183             | 23481           |
| 2008                                                                                                                      | 898          | 85           | 21630                       | 2282                        | 23912              | 0               | 185             | 23728           |
| 2009                                                                                                                      | 967          | 85           | 21837                       | 2304                        | 24141              | 0               | 187             | 23955           |
| 2010                                                                                                                      | 913          | 66           | 22022                       | 2323                        | 24346              | 0               | 188             | 24157           |
| 2011                                                                                                                      | 923          | 49           | 22221                       | 2344                        | 24565              | 0               | 190             | 24375           |
| 2012                                                                                                                      | 933          | 45           | 22443                       | 2368                        | 24811              | 0               | 192             | 24619           |
| 2013                                                                                                                      | 935          | 45           | 22661                       | 2391                        | 25053              | 0               | 194             | 24859           |
| 2014                                                                                                                      | 945          | 45           | 22898                       | 2416                        | 25314              | 0               | 196             | 25118           |
| 2015                                                                                                                      | 955          | 48           | 23141                       | 2441                        | 25582              | 0               | 198             | 25384           |
| 2016                                                                                                                      | 965          | 53           | 23387                       | 2467                        | 25854              | 0               | 200             | 25654           |
| 2017                                                                                                                      | 975          | 58           | 23634                       | 2493                        | 26128              | 0               | 202             | 25926           |
| 2018                                                                                                                      | 985          | 63           | 23883                       | 2520                        | 26402              | 0               | 204             | 26198           |
| 2019                                                                                                                      | 998          | 84           | 24150                       | 2548                        | 26698              | 0               | 206             | 26492           |
| 2020                                                                                                                      | 1005         | 95           | 24406                       | 2575                        | 26981              | 0               | 209             | 26772           |
| 2021                                                                                                                      | 1018         | 107          | 24669                       | 2603                        | 27272              | 0               | 211             | 27061           |
| 2022                                                                                                                      | 1028         | 124          | 24937                       | 2631                        | 27568              | 0               | 213             | 27354           |
| 2023                                                                                                                      | 1034         | 108          | 25169                       | 2655                        | 27824              | 0               | 215             | 27609           |
| - See the Glossary of Terms for a definition of Gross Total Energy, Non Firm Energy, Station Service and Net Firm Energy. |              |              |                             |                             |                    |                 |                 |                 |

## GLOSSARY OF TERMS

The two key differences in terminology used throughout this report are:

- 1) **GROSS vs NET** - for both energy and peak, gross figures include station service loads; whereas net figures exclude station service loads.
- 2) **TOTAL vs FIRM** - total energy includes non-firm energy; whereas firm energy excludes non-firm energy. Total peak adds back curtailed loads; whereas firm peak excludes curtailed loads.

**Station Service** - is electricity consumed by generating stations in the production of electric power.

**Non-Firm Energy** - includes all energy sold to Manitoba customers on a non-firm basis. This category includes all sales from the Surplus Energy Program (SEP).

**Curtaillable** - is load that can be curtailed on short notice. Customers are given a discount for subscribing to this less firm source of power. Curtailable loads affects peak demand because most periods of curtailment tend to be at or near the system peak. It is assumed that this rate will have no effect on energy consumption because customers can purchase make-up energy after the curtailment.

**Gross Total Energy** - includes all energy needed to meet the requirements of Manitoba customers on the integrated system. This figure includes station service and non-firm energy. This figure does not include diesel generation, Industrial self-generation, exports, exports losses or import gains.

**Net Total Energy** - same as Gross Total Energy except station service loads are excluded.

**Net Firm Energy** - same as Gross Total Energy except station service and non-firm loads are excluded.

**Gross Total Peak** - is the maximum hourly demand in a given year, required to meet the needs of Manitoba customers on the integrated system. This figure includes (adds back in) station service loads and curtaillable loads. This figure does not include diesel generation, Industrial self-generation, exports and losses associated with exports/imports.

**Net Total Peak** - same as Gross Total Peak except station service loads are excluded.

**Net Firm Peak** - same as Gross Total Peak except station service and curtaillable loads are excluded.